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Appendix A. Common Acronyms

ABAG: Association of Bay Area Governments

ADT: Average Daily Traffic

ANF: Angeles National Forest

APCD: Air Pollution Control District

ATV: All-Terrain Vehicle

AUM: Animal Unit Month

BA: Biological Assessment

BAER: Burned Area Emergency Rehabilitation

BCM: Backcountry motorized

BCNM: Backcountry non-motorized

BLM: Bureau of Land Management

BMP: Best Management Practices

Caltrans: California Department of Transportation

CBZ: Critical Biological Zones

CCC: Civilian Conservation Corps

CDFG: California Department of Fish and Game

CDMG: California Department of Mines and Geology

CEQ: Council on Environmental Quality

CEQA: California Environmental Quality Act

CERCLA: Federal Comprehensive Environmental Response, Compensation and Liability Act

CHMS: Carbonate Habitat Management Strategy

CIP: Capital Improvement Program

CIWMB: California Integrated Waste Management Board

CNF: Cleveland National Forest

COE: U.S. Army Corps of Engineers

CS: Consumer Surplus

CUA: Concentrated use areas

DAI: Developed Areas Intermix

DEIS: Draft Environmental Impact Statement

DOI: U.S. Department of the Interior

DOT: U.S. Department of Transportation

EF: Experimental Forest

EIS: Environmental Impact Statement

EPA: U.S. Environmental Protection Agency

EW: Existing Widerness

FAA: Federal Aviation Administration

FEIS: Final environmental impact statement

FERC: Federal Energy Regulatory Commission

FR: Federal Register

FSH: Forest Service Handbook

FSM: Forest Service Manual

FWS: Fish and Wildlife Service (See USFWS)

FY: Fiscal Year

GIS: Geographic Information System

GPS: Global Positioning System

HAP: Hazardous Air Pollutants

HWY: Highway

IDT: Interdisciplinary Team

IMPLAN: IMpact analysis for PLANning

IRA: Inventory Roadless Area

ISCST: Industrial Source Complex (Short Term)

IUCN: International Union for Conservation of Natural Resources

LEIMARS: Law Enforcement and Investigation Management Reporting System

LPNF: Los Padres National Forest

LRMP: Land and Resources Management Plan

LUZ: Land Use Zone

MCP: Market Clearing Price

MIS: Management Indicator Species

MIST: Minimum Impact (Wildfire) Suppression Techniques

ML: Road Maintenance Level

MMBF: Millions of Board Feet

MOU: Memorandum of Understanding

MP: Milepost

MW: Megawatts

NCCP: Natural Community Conservation Planning

NEPA: National Environmental Policy Act

NFMA: National Forest Management Act

NF: National Forest

NFS: National Forest System

NFSR: National Forest System Roads

NHPA: National Historic Preservation Act

NOAA: National Oceanographic and Atmospheric Administration

NOI: Notice of Intent

NSRE: National Survey of Recreation and the Environment

OHMVR: Off Highway Motor Vehicle Route

OHV: Off Highway Vehicle

PCH: Pacific Coast Highway also known as State Highway 1

PCT: Pacific Crest Trail

PSW: Pacific Southwest Forest and Range Experiment Station

RCA: Riparian Conservation Areas

RDM: Residual Dry Matter

RNA: Resource Natural Area

ROD: Record of Decision

ROS: Recreation Opportunity Spectrum

RPA: Resource Planning Act

RVD: Recreation Visitor Day

RW: Recommended Wilderness

SAC: Scenic Attractiveness Class

SANDAG: San Diego Association of Governments

SBNF: San Bernardino National Forest

SCAG: Southern California Association of Governments

SCMFA: Southern California Mountains and Foothills Assessment

SEA: Socioeconomic Assessment

SeDab: Southeast Desert Basin

SFP: Special Forest Products

SIA: Special Interest Area

spp.: Species

SRSJMNM: Santa Rosa and San Jacinto Mountains National Monument

SUV: Sport Utility Vehicle

T&E: Threatened and Endangered

TEPCS: Threatened, Endangered, Protected, Candidate and Sensitive Species

TEPS: Threatened, Endangered, Proposed or Sensitive

TES: Threatened, Endangered or Sensitive (See TEPS)

URI: Urban and Rural Interface

USDA: United States Department of Agriculture

USDI: United States Department of Interior

USFS: United States Forest Service

USFWS: United States Fish and Wildlife Service

USGS: United States Geological Survey

WD: Wheel Drive

WSR: Wild and Scenic Rivers

WRCPP: Western Regional Corridor Planning Partnership

WUI: Wildland Urban Intermix

Vpd: Vehicles per day

Appendix B. Species Viability

Species Lists

The following tables document the federally listed threatened, or endangered species and regionally listed sensitive species discussed in this document:

- Table 361: Federally Listed Plant Species - Endangered, Threatened, Proposed or Candidate
- Table 362: Federally Listed Animal Species - Endangered, Threatened, Proposed or Candidate
- Table 363: Sensitive Animal Species by Forest (known or potential)
- Table 364: USDA Forest Service, Pacific Southwest Region Sensitive Plant Species by Forest

Species within Critical Biological Land Use Zones

Table 365: Primary Species within Critical Biological Land Use Zones

Table 366: Proposed Critical Biological Land Use Zones for Riparian Dependent Species by Forest

Viability Analysis

Process for Evaluating Viability / Ecosystem Sustainability

Process for Evaluating Viability/Ecosystem Sustainability

Angeles, Cleveland, Los Padres, and San Bernardino National Forests

The Forest Service is mandated to manage habitats to maintain viable populations of existing native and desired non-native wildlife, fish, and plant species, as indicated by the following information:

36 CFR 219.19: "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area."

Departmental Regulation 9500-4: Manage "habitats for all existing native and desired non-native plants, fish, and wildlife species in order to maintain at least viable populations of such species."

36 CFR 219.19: "For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained habitat must be provided to support at least a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.

The forest planning management goals to be attained by the end of the planning period are as follows:

Ecosystem sustainability will be enhanced or maintained by ensuring the viability of all native plant and animal species.

Measurable contributions are made to the recovery of federally listed plants and animals.

There will be less need to designate sensitive species (USDA 1999b).

The planning regulations call for a broad-scale assessment of social, economic, and ecological issues. For plan

revisions, information and analyses for ecosystem diversity and species diversity must be developed, including air, soil and water resources, major vegetation types and species. Evaluation of ecological sustainability must be conducted for ecosystems and species.

Existing Information

Three sources of current existing information are available to aid in describing and evaluating ecosystem and species diversity. They are described in detail below.

1. Southern California Mountains and Foothills Assessment

In July 1995, the southern California National Forests in U.S. Forest Service Region 5 began an effort to assess the state of species and identify the risks to the viability of species populations. The resulting document is the *Southern California Mountains and Foothills Assessment: Habitat and Species Conservation Issues* (SCMFA) (Stephenson, John R. and Gena M. Calcarone. 1999. General Technical Report PSW-GTR-172. USDA Forest Service, Pacific Southwest Research Station, Albany, CA. 402 pp).

Various scientists both within and outside of the Forest Service reviewed the SCMFA. Below is a partial list of those reviewers.

Edith Allen, Dept. of Botany and Plant Sciences, UC, Riverside

Michael J.Arbaugh, USDA PSW Riverside Forest Fire Laboratory, Forest Ecologist

Jan L., Beyers, USDA PSW Riverside Forest Fire Laboratory, Plant Ecologist

Steven Boyd, Rancho Santa Ana Botanic Garden

Daniel S., Cooper, Dept. of Earth Sciences, UC, Riverside

Joseph Copp, California Academy of Sciences, La Jolla

Ron Cowan, The Quercus Group, Horizon Forest Products, Richmond

Ed Ervin, USGS, San Diego State University, San Diego

Janet Franklin, Dept. of Geog., San Diego State University, San Diego

Robert Goodman, Jr., California Polytechnic State University, Pomona

Hazel Gordon, USDA Sacramento Remote Sensing Lab, Ecologist

Jim Greaves, Independent Consultant, Santa Barbara

Dan Holland, Independent herpetology consultant

Robert McKernan, San Bernardino County Natural History Museum

Laura Merrill, USDA PSW Riverside Forest Fire Laboratory, Entomologist

Richard Minnich, Earth Sciences Dept., University of California, Riverside

Jenny Rechel, USDA PSW Riverside Forest Fire Laboratory

Tom Scott, University of California, Riverside

Glenn Stewart, Professor of Zoology, Cal Poly University, Pomona

Sam Sweet, University of California, Santa Barbara

David Weise, USDA PSW Riverside Forest Fire Laboratory

Scott White, Scott White Consulting

Dieter Wilken, Dir. of Research, Santa Barbara Botanic Garden

Paul Zedler, Institute for Environmental Studies, University of Wisconsin, Madison

The SCMFA "describes existing conditions and compiles the best available knowledge of the ecosystems, habitats, and species in this region" at the time of its publication. The SCMFA goes on to state that it brings

together information from published reports, field surveys, unpublished technical reports ("gray literature"), agency files, and expert opinion. The assessment area covers 6.1 million acres of mountains and foothills that form a chain from Monterey south to the Mexican border, of which 3.5 million acres are contained within the four southern California National Forests. Data on landscapes, habitats, and species were compiled into a Geographic Information System (GIS) database, which allows information to be displayed graphically as maps of important environmental attributes, vegetation types, species distributions, fire history, and so forth.

From the SCMFA, "according to the California Wildlife Habitat Relationships System (CWHR), and the California Flora Database (CALFLORA), a total 18 amphibian, 61 reptile, 299 birds, 104 mammal, and 2,999 vascular plants occur in the assessment area. Added to that is an unknown multitude of invertebrate animals and nonvascular plants." A total of 439 species of plants and animals, including invertebrates, were identified as focal species. The 184 species of focal animals included: 12 of high public interest, 31 TEP, and 141 other potentially vulnerable species. The 255 species of focal plants included: 32 TEP, and 223 other potentially vulnerable species. Taxa were selected using various "species of concern" lists that state and federal wildlife agencies and private conservation organizations have developed (fig. 4.1). Also identified were species that are considered common elsewhere but are rare or potentially at risk within the assessment area. Each identified species possesses one or more of the following traits: (1) occurs in only a few limited areas, (2) is particularly vulnerable to prevailing landscape changes, (3) has a small population size, (4) has large area requirements, or (5) there is a great deal of uncertainty about its distribution and abundance. The remaining species in southern California found or with potential to be found on NFS lands did not meet the above criteria and were determined to have very low vulnerability concerns.

2. Monitoring and Evaluation Report (M&E Report)

After publication of the SCMFA, an interdisciplinary team, drawn from the four southern California National Forests and the Pacific Southwest Research Station used the SCMFA and other forest documents to review how well the Forest Plans met the needs of threatened, endangered and sensitive (TES) species. The team's analysis, called the *Province Forest Plan Monitoring and Evaluation Report* (M&E Report, 1999), identified a number of areas where existing Forest Plans do not adequately protect TES species or provide direction necessary to sustain particular ecological communities. The M&E Report subsequently recommended revision of the Forest Plans to address these issues.

3. Province Consultation Package Biological Assessment and Biological Opinion

Further evaluation of the impacts of current Forest Plans on one component of ecological sustainability –the status of threatened, endangered, and proposed (TEP) species – was recently compiled for the programmatic consultation for the four southern California National Forests existing Forest Plans (Province Consultation Package, 2000). The evaluation has been summarized in the "Biological and Conference Opinions on the Continued Implementation of Land and Resource Management Plans for the four southern California National Forests, as Modified by New interim Management Direction and Conservation Measures" issued by the U.S. Fish and Wildlife Service (FWS) on February 27, 2001. The effects analyses conducted as part of the Province Consultation Package identified a number of immediate impacts to TEP species caused by ongoing activities occurring on the national forests. Interim management direction and conservation measures were developed to address these threats. These measures became mandatory terms and conditions.

Viability Assessment Methods

Species reports and viability assessments were prepared during the DEIS effects analysis phase. Recent Washington Office policy decisions regarding the adequacy of species viability assessments required for forest planning will be our basis for conducting species viability assessments. Because there are no standard methods established, the Washington Office has indicated that in cases where population and habitat trends are believed to be in significant decline throughout the planning area, and substantial habitat disruption is allowed by the Forest Plan, a more rigorous approach to maintaining viability is necessary. In cases where population and habitat trends are believed to be within the range of historic variation (RHV), and the Forest Plan allows little additional habitat disturbance, a much less rigorous analysis is warranted. In such cases, a more qualitative approach to factors such as trend analysis may suffice, as long as the approach considers the relevant factors and demonstrates sound judgment, including a rational explanation for the level of analysis conducted.

The process we are using is based, in part, on the Tongass Population Viability Assessment for Land Management Planning, Columbia River Basin Assessment, Forest Ecosystem Management Assessment Team, Committee of

Scientists report, U.S. Forest Service Region 1/Region 4 Terrestrial Protocols, Forest Service Washington Office Review, the Conservation Breeding Specialists Groups, and the Region 9 Minnesota and Wisconsin Viability Analysis.

Select species for viability concerns

In November 2000, a biological specialist team convened specifically to review the species information listed in the SCMFA. The biological specialist team consisted of the four Forest Biologists, Bill Brown (ANF), Maeton Freel (LPNF), Steve Loe (SBNF), and Scott Eliason (SBNF) standing in for Kirsten Winter (CNF) and Diane Freeman (SCCS representative). Their review led to some changes in the species list information. Specifically, changes or updates were made with regard to species status, distribution, habitat group, and conservation category.

The species selected for viability assessment fall into one or more of the following categories:

Mountain and Foothills Assessment list of Focal Species

Regional Forester Sensitive Species List for Region 5

Federally listed as threatened, endangered, candidate, or proposed

Former USFWS candidate species "species of concern"

State of California endangered, threatened, rare, or species of special concern

Riparian Obligate Species of Concern as defined by California Partners in Flight

Taxa from CNPS List 1B, any rediscovered List 1A, and taxa from List 2, List 3, and List 4 if RED code in (2-2-3, 2-3-3, 3-2-3, 3-3-3

Heritage Rank of G1, G2, or G3, or GXT1, GXT2, or GXT3

Biologist or botanist expertise in reviewing local ecosystems of concern and those considered at risk from adjacent county habitat conservation planning efforts

Additional species during a Regional Forester's sensitive species review process for plants.

The SCMFA assigned a conservation category to each species based on conservation potential and needs on public lands. "Site-specific" species require site-specific conservation attention; "landscape level" species are best conserved through habitat or landscape-level management; and "minimal influence" species are those for which there is minimal ability to conserve the species on public lands within the assessment area. The team found some site-specific species that were adequately addressed under the habitat group characteristics and changed the category to the landscape level category. Conversely, some landscape level species that were not adequately addressed under habitat group characteristics were changed to the site-specific category.

Southern California Forest Plan Revision Habitat and Species Reports Prepared by Jones & Stokes Company

In November 2001, a contract was established with Jones & Stokes to develop species and habitat accounts. Habitat accounts were developed for alpine, subalpine, chaparral, coastal sage scrub, desert montane, desert scrub, gabbro outcrops, lakes/reservoirs, limestone/carbonate outcrops, lower montane forest, montane forest, montane conifer forest, montane meadows, Monterey coastal, oak woodland, savanna, grassland, pebble plain, riparian, serpentine outcrops and vernal pool habitats. The contents include a description, distribution, abundance, ecological processes, factors influencing ecological processes, and management considerations for each habitat. Species accounts were written for 197 animals (14 amphibians, 72 birds, 12 fish, 30 invertebrates, 46 mammals, 23 reptiles) and 287 plants. Contents of each species included as appropriate the federal or state status, distribution and known occurrences, systematics, habitat requirements, reproduction, activity, dispersal, migration, diet and foraging, territoriality/home range, predator-prey relationships, inter and intraspecific interactions, population status and trends, and conservation considerations. A literature review was conducted for the species and habitat selected for evaluation. The primary reference to start from was the SCMFA. The information gathering process included collecting available published information on the species' biology and ecology by conducting scientific literature review. We were not trying to create complete treatises on the natural history of each species. Species experts were contacted informally to provide literature sources or offer expert

opinions in completion of some information items. Due to the length of 487 accounts, these species accounts are not included in the DEIS but are available for review and will be available for forest personnel to utilize during planning. The information contained in these accounts will be summarized as needed to complete the affected environment and environmental consequences sections of the DEIS/FEIS.

An initial internal review process was established to provide for consistency and format. Afterwards, the draft accounts were placed on a website, and members of the scientific community and Forest Service specialists were invited to review and update the information in these draft reports. We particularly sought their knowledge of species locations, habitat requirements, population trends, and threats to species persistence, especially on National Forest System lands in southern California. We asked for management action suggestions to help conserve species in the planning area. We asked, "that much of the detailed information on these species is contained in specialized documents - not available to our writers - or is unpublished in the files of species experts. Your willingness to share your expertise and add information to these reports will ensure that the best, most recent scientific information is available to inform the analysis and decision-making processes." Fifty-one individuals reviewed 100 documents. During this time, expert opinion was also provided to Forest Service biologists and botanists informally through individual contact with experts at universities, California Department of Fish and Game, and private organizations.

Species Accounts

The 197 animal and 287 plant species reports completed by the Jones and Stokes contract for which there may be a concern for viability, "species of concern", were reviewed by a set of botanists and biologists from each of the four forests, Pacific Southwest Research Station, and the forest plan revision office. These personnel included Linh Davis, Scott Eliason, Mike Foster, Debby Hyde-Sato, Steve Loe, Donna Toth, Jan Beyers, Leslie Welch, Richard Wales, Mary Thomas and Steve Anderson.

This review, from late 2002 to mid 2003, included determining if any additional information remained to be found on individual species. Some additional information was obtained in Forest Service office file folders for species and from web sites. Selected personal contacts were made with different agencies and scientists to obtain any recent reports, voucher specimens, or updates to species occurrences. The species reports evolved into the current species accounts.

The team also reviewed the accounts to determine vulnerability of species to decisions that are to be made in Forest Plans (desired conditions/objectives, land use zones, suitable uses, standards, congressional action recommendations, and monitoring). In analyzing viability, the extent of information available about species, their habitats, the dynamic nature of ecosystems and the ecological conditions needed to support them must be identified. If available, the team looked at known presence and trends in range, distribution, and abundance; habitat characteristics and requirements and presence on NFS lands, threats, and subsequent vulnerabilities, on and off NFS land from a fine (site specific) and coarse (landscape) filter approach. Heritage rarity rankings (see below) were also included and reviewed during the evaluations.

Based upon the above species assessments species were assigned one of the following risk or threat categories:

1. Not found in the Plan area.
2. Potential habitat only in the Plan area.
3. Common or widespread in Plan area with no substantial threats to persistence or distribution from Forest Service activities.
4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.
5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.
6. Common or widespread in Plan area with substantial threats to persistence or distribution from Forest Service activities.

   (1) Endemic species: Species whose entire distribution is restricted to a single planning area.

   All else being equal, the type of species with small populations that is both endemic to a planning

region and specific to one or only a few habitats faces the greatest viability risks. However, not all of these species need to be subjected to viability assessments. Some species will occupy specific sites that may not be affected by any management alternative in the forest planning process (e.g., a cave, cliff, bog), requiring only that site-specific management projects avoid these areas.

(2) Disjunct species: Species whose natural distribution has resulted in one or more populations on the planning area that are either isolated from each other and/or from other populations outside the planning area.

If the species as a whole remains well distributed, and its populations generally are not declining or threatened, then a viability assessment is not necessary. If, on the other hand, the species is known to be declining in a significant portion of its range, then these populations will require viability assessments. Regardless of whether disjunct populations are subjected to viability assessments, they are likely to have diverged genetically or morphologically from less isolated populations.

(3) Peripheral species: Species with a population that only partially occurs within the planning area.

These populations should be considered important for conservation attention in two sets of circumstances. First, if the population in question occurs at the northern end of the limits of the species distribution, it potentially could become a central or core population in the future under various global climate change scenarios. Second, if the peripheral populations belong to a species that has already suffered declines and habitat losses in major portions of the species range these peripheral populations may represent the only conservation opportunities in the future.

(4) Uncommon species: Species that are inherently rare and not naturally well-distributed species across the planning area.

Some species may be intrinsically rare due to habitat specificity. Again, whether such species are subject to viability assessments depends upon proposed actions. In most cases their habitat needs can be addressed at the project level stage. For the same reasons as noted above, a prudent step is to maintain these species on at-risk lists so that managers are reminded of the specific habitat needs and appropriate conservation measures for these species.

(5) Common or widespread species: Species well known and often encountered in databases or reports or known or suspected to occur throughout all or most of the four forests.

The species accounts are living or dynamic documents that will be updated continuously as new information becomes available as a result of new information, monitoring and evaluation.

- Table 369: Animal Species Evaluated for Viability Concerns List (Species of Concern)
- Table 373: Summary of Animal Threats by Vegetation Group
- Table 189: Results of threat assessment for animal species of conservation concern in the Plan area: number of species in each threat category
- Table 360: Plant Species Evaluated for Viability Concerns List (Species of Concern)
- Table 374: Summary of Plant Threats by Vegetation Group
- Table 188: Results of threat assessment for plant species of conservation concern in the Plan area: number of species in each threat category

Determination of species selected for additional viability assessments

Those species determined to have a risk or threat category of 5 and 6, "species at risk", were carried forward for more detailed review and analysis. They received a more detailed species by species viability assessment that is included within each species account. The information contained in these assessments is summarized as needed to complete the affected environment and environmental consequences sections of the DEIS/FEIS.

- Table 370: Animal Species at Risk List
- Table 367: Plant species determined to be at substantial risk from Forest Service activities along with types of threats that affect them. All plants are in risk category 5

Determine the outcome of viability analysis for species carried forward for more detailed analysis.

Quantitative Approaches

Quantitative assessment is more complex, and usually includes analysis of life history transition probabilities and estimates of the genetic, environmental, demographic, and catastrophic factors. To support such an assessment demographic studies are typically conducted by following the fate of individuals of all size classes over multiple years in permanent plots or transects. For most if not all of our species the data needed to conduct this type of viability assessment is not available.

Qualitative approaches and considerations

The geographic distribution of the population is a very important consideration when assessing viability, especially at Forest Plan or regional scales. Disjunct or peripheral populations may contain genetic variation that is not present in populations that are within the core of a species' range; maintenance of these populations may be important for ensuring the retention of the evolutionary adaptability and potential of the species. Also, the maintenance of the geographic distribution of populations is an important consideration in ensuring metapopulation viability.

We included the known or estimated number and size of populations, at forest, regional, and range-wide levels. A useful approach in assessing the importance of geographic distribution to viability is to summarize occurrence information for each of the following scales: global range, statewide range and distribution and status of the species on NFS lands. The historical geographic distribution, and the reasons for rarity, may also be important. Metapopulation structure and dynamics was also considered, as a means of addressing "geographic distribution viability." The existence of many populations is especially critical for species that inhabit patches in a shifting mosaic of habitats. Metapopulation dynamics are likely to become increasingly important as habitat areas become fragmented. Thus, the maintenance of metapopulation structure will be more likely to allow the species to withstand adverse land management effects (as well as future stochastic habitat changes). The maintenance of this "distribution viability" should also serve as a good surrogate for maintaining less easily observed features that also affect the viability of a species, such as genetic variation patterns, pollinator relationships, seed dispersal patterns, and gene flow within and among populations.

Each alternative was evaluated and compared to each of the other alternatives in terms of their probability of increasing or reducing the threats that exist on the landscape. For example, road building increases the risk that rare plants will be threatened by loss of habitat or that rare plant habitat will be degraded by dust, off-road trespass, and the introduction of non-native and invasive plant species. Thus, alternatives that result in increased road building or use would increase the amount of threats that exist for rare plants. This enabled us to make a statement about the likelihood of persistence in the planning area as we implement the revised forest plans. These viability outcome statements are needed to inform decision makers on the probability that any give alternative will comply with NFMA direction to maintain species well distributed across the planning area. This information is summarized and displayed in tabular formats.

During the review, the biology and botanist team evaluated how each alternative incorporated into plan alternatives and standards the following types of information:

> Identify the types, amounts, distribution, and connectivity of habitats as well as the types and amounts of ecological processes needed to maintain the species.
>
> Conservation practices needed to ensure species viability.
>
> Coarse-filter approaches that provide suitably distributed habitat for the persistence species in the coarse-filter process.
>
> Fine-filter approaches that provide suitably distributed habitat for the persistence of species in the fine-filter process.
>
> Landscape linkages approaches that will provide for persistence of species selected for the population viability assessment.

Ecological processes that will maintain viable populations.

Management practices are most effective in maintaining species viability.

Viability Outcomes

The likelihood of persistence for species-at-risk was completed by evaluating each DEIS alternative's mix of land allocations and suitable uses, and predicted output or emphasis; by reviewing the conclusions presented in the DEIS effects section; and by evaluating the information presented in the species accounts concerning the habitat requirements, life history traits, listing packages, recovery plans, and recent field survey data. The likelihood of persistence for each species-at-risk was estimated using the following outcome statements.

Viability outcomes were based upon the expected likelihood of species persistence or trend within the 10 - 15 year timeframe of the land management plans and the trajectory of this estimated trend out to 50 years.

For Plants and Invertebrates (with host plants) on National Forest System lands:

A. Habitat is sufficient quality, distribution, and abundance to allow the species population to remain stable or stabilize, well distributed across historic range on NFS land.

B. Habitat is of sufficient quality, distribution, and abundance to allow the species population to remain stable or stabilize, but with significant gaps in the historic species distribution on NFS land. These gaps cause some limitations in interactions among populations.

C. Habitat only allows continued species existence in isolated patches relative to the historic distribution, with strong limitations on interactions among or within local populations on NFS land.

D. Habitat conditions likely result in the loss of populations (occurrences) such that the potential for extirpation from NFS lands is high.

E. Small population size in plants that are inherently rare and not naturally well distributed may result in the loss of populations (occurrences) from stochastic events such that the potential for extirpation from NFS lands is high. Potential for extirpation is unrelated to uses and activities on NFS land.

For Animals on National Forest System lands:

A. Suitable habitat is well distributed and abundant across NFS lands.

B. Suitable habitat is either well distributed or abundant across NFS lands; however, there are temporary gaps where suitable habitat is absent or only present in low abundance. Disjunct areas of suitable habitat are typically large enough and close enough to permit dispersal and interaction among subpopulations.

C. Suitable habitat is often distributed as patches or exists at low abundance, or both across NFS lands. Gaps, where suitable habitat is either absent or present in low abundance, are large enough to isolate some subpopulations, limiting opportunity for species interactions. In most of the species range there are opportunities for dispersal and interaction among subpopulations; however, some subpopulations are so disjunct or of such low density that they are essentially isolated.

D. Suitable habitat is highly isolated or exists at very low abundance, or both across NFS lands. While some subpopulations associated with these habitats may be self-sustaining, there is limited or no opportunity for population interaction, resulting in potential for local or regional extirpation, and low likelihood of recolonization. There has likely been a reduction in overall species range from historical conditions, except for some rare, local endemics that may have persisted in this condition since the historical period.

E. Suitable habitat is highly isolated and exists at very low abundance across NFS lands. Populations have declined irrespective of habitat conditions or have little or no interaction. This results in strong potential for local or regional extirpation, and no likelihood of recolonization.

For all land within range of species (based in part on the geographic distribution within which the species is projected to persist):

A. The combination of environmental (habitat) and population conditions allows the species population to remain stable or stabilize, well distributed across historic range.

B. The combination of environmental (habitat) and population conditions allows the species population to remain stable or stabilize, but with significant gaps in the historic species distribution. These gaps cause some limitations in interactions among populations.

C. The combination of environmental (habitat) and population conditions only allows continued species existence in isolated patches relative to the historic distribution, with strong limitations on interactions among or within local populations.

D. The combination of environmental (habitat) and population conditions likely result in the loss of populations (occurrences).

In the outcome statements, "well distributed" is in reference to the historic range of the species, not necessarily the entire province or even an entire National Forest. "Stable" implies self-sustaining populations that are reproducing sufficiently that extinction probability is low. The following tables document the results of viability outcome determinations:

- Table 371: Viability outcome statements by alternative for vertebrate animal species-at-risk
- Table 372: Viability outcome statements by alternative for invertebrate animal species-at-risk
- Table 368: Viability outcome statements by alternative for plant species-at-risk

Identification of Mitigation or Conservation Needs

Additional mitigations for habitat management were developed to ensure species persistence and distribution. Mitigations included standards, appropriate design criteria and species or habitat conservation considerations. "Mitigation" includes:

Avoiding the impact altogether by not taking a certain action or parts of an action.

Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

Compensating for the impact by replacing or providing substitute resources or environments.

Conservation considerations, practices, programs or needs, are identified within each species account and are pro-active measures that are expected to:

Protect the species and habitat from the effects of forest management.

Assist in the habitat enhancement.

Information gathering.

Conservation education.

Endangered and threatened species recovery and de-listing.

Avoid or correct a downward trend for Forest Service sensitive species.

These conservation considerations are expected to be incorporated into priority goals, program direction and place based program emphasis over the next 5 - 15 years. Table 375: Conservation Emphasis Areas - Priority opportunities for the next 3-5 years

Species Management or Conservation Strategies

Several species and habitats have existing species or habitat management guides, plans or strategies. Guides, plans, and strategies are similar names for a document that has measures to maintain or improve viability such as a recovery plan for an endangered species or a guide to assist the forest in managing a species at the fine filter project level. A list of these plans are provided below. Some internal Forest Service plans or guides are outdated with information incorporated into the new species accounts. Species accounts, for species at risk and where no current plan, guide or strategy exists or for a species that has outdated guide or plan, may serve as a basis for a species conservation strategy until a more formal document is necessary. Development of more exhaustive species conservation strategies will be based on future needs, opportunities or partnerships with other agencies and/or conservation groups.

NatureServe Website

NatureServe Website Version 1.8 (1 July 2003). Listed below are definitions for interpreting the status ranks. Ranks are assigned by NatureServe scientists or by a designated lead office in the Natural Heritage Network.

G1 - Critically Imperiled--Critically imperiled globally because of extreme rarity or because of some factor(s) making it especially vulnerable to extinction. Typically 5 or fewer occurrences or very few remaining individuals (< 1,000) or acres (< 2,000) or linear miles (< 10).

G2 - Imperiled--Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction or elimination. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000) or acres (2,000 to 10,000) or linear miles (10 to 50).

G3 - Vulnerable--Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction or elimination. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

G4 - Apparently Secure--Uncommon but not rare (although it may be rare in parts of its range, particularly on the periphery), and usually widespread. Apparently not vulnerable in most of its range, but possibly cause for long-term concern. Typically more than 100 occurrences and more than 10,000 individuals.

G5 - Secure--Common, widespread, and abundant (although it may be rare in parts of its range, particularly on the periphery). Not vulnerable in most of its range. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

G? - Unranked--Global rank not yet assessed.

HYB - Hybrid--Element not ranked because it represents an interspecific hybrid and not a species.

T# - Infraspecific Taxon (trinomial)--The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above.

S1 - Critically Imperiled--Critically imperiled in the nation or subnation* because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the subnation. Typically 5 or fewer occurrences or very few remaining individuals (< 1,000).

S2 - Imperiled--Imperiled in the nation or subnation* because of rarity or because of some factor(s) making it very vulnerable to extirpation from the nation or subnation. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000).

S3 - Vulnerable--Vulnerable in the nation or subnation* either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

S4 - Apparently Secure--Uncommon but not rare, and usually widespread in the nation or subnation*. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.

S5 - Secure--Common, widespread, and abundant in the nation or subnation*. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

S? - Unranked--Nation or subnation* rank not yet assessed.

Existing Species Recovery Plans

Federal Recovery Plan for Marsh sandwort

Federal Recovery Plan for Brauton's milk-vetch

Federal Recovery Plan for California jewelflower

Federal Recovery Plan for Santa Monica Mountains dudleya

Federal Recovery Plan for Hoover's eriastrum

Federal Recovery Plan for Gambel's watercress

Federal Recovery Plan for bird footed checherbloom

Federal Recovery Plan for California dandelion

Federal Recovery Plan for Smith's blue butterfly

Federal Recovery Plan for unarmored three-spine stickleback

Federal Recovery Plan for arroyo toad

Federal Recovery Plan for California red-legged frog

Federal Recovery Plan for desert tortoise

Federal Recovery Plan for blunt-nosed leapard lizard

Federal Recovery Plan for California brown pelican

Federal Recovery Plan for California least tern

Federal Recovery Plan for marbled murrelet

Federal Recovery Plan for California condor

Federal Recovery Plan for bald eagle

Federal Recovery Plan for southwestern willow flycatcher

Federal Recovery Plan for giant kangaroo rat

Federal Recovery Plan for San Joaquin kit fox

Federal Recovery Plan for southern sea otter

Federal Recovery Plan for Stellar's sea lion

Federal Recovery Plan for Peninsular bighorn sheep

Existing Forest Service Species Management Plans, Guides, Strategies

San Bernardino NF Meadow Habitat Management Guide

San Bernardino NF Pebble Plain Habitat Management Guide

San Bernardino NF Carbonate Habitat Management Strategy

Cleveland NF Montane Meadow Management Plan

Mountain Yellow-legged Frog Conservation Assessment and Strategy for the Angeles & San Bernadino NF

San Gabriel Mountain Sheep Biological and Management Considerations

Habitat management guide for Southern rubber boa

Species management guide for *Acanthomintha illicifolia*

Species management guide for *Allium munzii*

Species management guide for *Castilleja gleasonii*

Species management guide for *Claytonia lanceolata var personii*

Species/Fire management guide for *Cupressus forbesii*

Species/Fire management guide for *Cupressus stephensonii*

Species management guide for *Delphinium hesperium* ssp. *cuyamacae*

Species management guide for *Dodecahema leptoceras*

Species management guide for *Downingia concolor* var. *brevior,*

Species management guide for *Dudleya densiflora*

Species management guide for *Eriogonium microthecum var. johnstonii*

Species management guide for *Galium grande*

Species management guide for *Lilium parryi*

Species management guide for *Machaeranthera asteroides var. lagunensis*

Species management guide for *Mahonia/Berberis nevinii*

Species management guide for *Opuntia basilaris var. brachyclada*

Species management guide for *Orobanche valida* ssp. *valida*

Other Documents Available for Planning

California Partners in Flight Coastal Scrub and Chaparral Bird Conservation Plan

California Partners in Flight Coniferous Forest Conservation Plan

California Partners in Flight Oak Woodland Bird Conservation Plan

California Partners in Flight Riparian Bird Conservation Plan

Process for Landscape Linkage

Two processes were used to propose land use zoning that promoted forest habitat and landscape linkages for wildlife and plant movement within and across the four southern California National Forests.

The first process used information and maps from the Missing Linkages Initiative - Missing Linkages Restoring Connectivity to the California Landscape document and map package developed by the California Wilderness Coalition, The Nature Conservancy, the Biological Resource Division of the United States Geological Survey, the San Diego Zoo -Center for Reproduction of Endangered Species, and California State Parks. The document and maps are based on a meeting with personnel from multiple agencies and conservation organizations that met in San Diego on November 2, 2000. (Penrod, K. 2000. Proceedings of Missing linkages: Restoring connectivity to the California landscape. South Coast Wildlands Project, San Diego Zoo, Nov. 2, 2000).

Forest Habitat Linkages were identified as an issue during scoping for the forest plan revision process. Portions of the Missing Linkages document relevant to the southern California National Forests were provided to the Forests in Section 14, the Habitat Linkage chapter of a plan alternative submitted by a coalition of environmental organizations. The eleven habitat linkages described in Section 14 were used to propose zoning for wildlife movement in four of the six Alternatives for the DEIS. One additional corridor connecting the northern border of the San Bernardino National Forest from the Desert Rim Place to Fifteen Mile Valley was included in some of the Alternatives. The South Coast Ecoregion map showing existing lands used for wildlife corridors and also lands currently thought to be needed to complete the corridors along with existing and proposed Wilderness, Core and proposed Agency Lands, Connectivity Zones and Stewardship Zones was utilized along with Forest Service generated GIS maps of proposed Land Use Zones identified as Map Number bdf_zone_alt6 dated 2/14/03, accordingly for each Forest. Maps were compared and locations of proposed corridors were reviewed with the following question in mind.

How are forest habitat linkages that connect to the Forests zoned at the connection points? These general areas should be zoned for uses compatible with keeping the landscape in a more natural or less developed status.

In many locations, in Alternative 3 and 6, existing and recommended Wilderness zoning or Back Country Non-Motorized zoning was currently in place and no proposals to the zoning were needed. In locations where

this did not occur, the connection point was zoned as Back Country Non-Motorized. The zoning in Alternative 2 was zoned similar to Alternative 3 in most situations. Some of the proposed zoning was carried into Alternative 4 where it did not conflict with multiple use activities. No zoning for Recommended Wilderness, Critical Biological or Back Country Non-Motorized was provided in Alt. 5.

The second process used the existing San Bernardino National Forest Wildlife Emphasis Area maps and information from Forest Plan Revision ID team members knowledgeable in wildlife management and familiar with the land. This process looked at the current zoning of proposed Wildlife Emphasis Areas on the San Bernardino National Forest in alternatives 2, 3, 4 and 6. These Wildlife Emphasis Areas are currently in place with the existing San Bernardino Land and Resource Management Plan and are proposed for similar designation in the Forest Plan revision. If Wildlife Emphasis Areas were zoned within Existing or Recommended Wilderness, Back Country Non-Motorized or Critical Biological Zones, no changes were recommended. If not, adjacent polygons were proposed for Back Country Non-Motorized zoning. There may be some situations where a portion of the area remained Back Country Motorized. All locations in Alternative 6 would have been provided protection by one or several of these zoning categories, as would most locations in Alt 3 and some locations in Alternative 2 and 4. No zoning for Recommended Wilderness, Critical Biological or Back Country Non-Motorized was provided in Alt. 5.

Process for Evaluating Management Indicator Species

Management Indicator Species Selection Process Record

National Forests of Southern California, July 16, 2003

Introduction

National Forest Management Act Regulations, adopted in 1982, require selection of Management Indicator Species (MIS) during development of forest plans (36 CFR 219.19(a)). Reasons for their selection must be stated. This document describes the process and rationale used to select MIS for the revised Land and Resource Management Plan for the national forests of southern California.

Management Indicator Species are to be selected “because their population changes are believed to indicate the effects of management activities” (36 CFR 219.19(a)(1)), and as a focus for monitoring (36 CFR 219(a)(6)). Where appropriate, MIS shall represent the following groups of species (36 CFR 219(a)(1)):

1. Threatened and endangered species on State and Federal lists,
2. Species with special habitat needs,
3. Species commonly hunted, fished, or trapped,
4. Non-game species of special-interest, and
5. Species selected to indicate effects of management activities on other species of selected major biological communities or on water quality.

The MIS process is but one tool used to develop management strategies and monitoring programs designed to meet NFMA requirements related to diversity of plant and animal communities. Other elements used for comprehensive planning for plant and animal diversity include: objectives and standards for vegetation management, biological assessments and evaluations at both the forest plan and site-specific project levels; and evaluation of risk to species of viability concern at the forest plan level. Other elements important to monitoring effects of plan implementation on plant and animal diversity include, where appropriate, monitoring of key ecological conditions, species assemblages, harvest levels of game and other demand species, and populations of threatened, endangered, and sensitive species.

The Selection Process

One of the guiding principles in the selection process was to look for and identify species with wide distributions that could serve as province-wide MIS. The rationale for this approach is two-fold:

1. Gain economy of scale by working together across administrative boundaries to use common species,

techniques, and analysis processes to facilitate inter-forest interpretation of the data.

2. Many of the issues facing the plant and wildlife populations in southern California are the result of landscape level stressors. Meaningful monitoring of Forest Plan implementation often can only occur at the bioregional and province-level.

In our selection process we also kept in mind that although the regulation requires the selection of certain vertebrate and/or invertebrate species as MIS it does not preclude the selection of other life forms. We included vascular plants as candidates for MIS as these species are often wide-ranging and responsive to landscape-level stressors. We also considered undesirable non-native plants and animals, as these species are often the source of landscape level stress.

Consideration of MIS for the revised forest plans started with current lists of MIS (see table 432: Existing Management Indicator Species by National Forest). The list of MIS for the San Bernardino National Forest is quite lengthy. The great length was due, in part, to the premise that the Forest MIS list should include all species of potential concern (i.e., threatened, endangered, sensitive, or watch list). For this reason, many of the species formerly designated as MIS are not discussed in detail in the following narrative. Refer to table 434: Existing Management Indicator Species from the San Bernardino National Forest for more information why these animals were not selected as MIS.

Additional species were considered under each of the five categories of potential MIS identified under 36 CFR 219(a)(1). All species considered (see also Table A) were assessed using the following criteria to determine their appropriateness as MIS:

1. Changes in the species' population should primarily reflect the effects of national forest management activities, and

2. Population trends of the species must be capable of being effectively and efficiently monitored and evaluated.

1. Threatened and Endangered Species

Species within this category are identified as threatened or endangered on state or federal lists. They could be selected as MIS to focus attention on species with viability concerns and whose population levels are directly tied to effects of national forest management. These taxa already receive attention during planning and monitoring by virtue of their status under state and federal endangered species acts, Forest Service policy, and NFMA regulations. Therefore, designation of species from this category as MIS is in many ways redundant. Our consideration of MIS status for species within this category was focused on identifying those species whose population trends and persistence are especially dependent on national forest management activities.

Peninsular Bighorn Sheep

Less than two percent of Peninsular bighorn sheep habitat occurs on National Forest System land, and two of the three factors that are threatening the bighorn sheep, habitat loss from development and disease from domestic livestock, are outside the control of national forest management (Stephenson and Calcarone 1999). Because so little habitat is present on National Forest System land and because changes in bighorn sheep populations are not likely to be related to national forest management, Peninsular bighorn sheep are not appropriate as a MIS.

Stephen's Kangaroo Rat

The endangered Stephen's Kangaroo Rat is not selected as a MIS. The species has not been confirmed to occur on National Forest System land and is only suspected to occur on the edge of the Cleveland National Forest. The abundance of Stephen's kangaroo rat is not related to the management of National Forest System lands.

Bald Eagle

Bald eagles are not appropriate as a MIS due to their wide ranging movements and the transient nature of their use of the national forests of southern California. Seldom seen except at large reservoirs such as Big Bear Lake, bald eagles spend much of their time off the national forests. It would be difficult to associate bald eagle population trends with national forest management activities. Monitoring of bald eagles, as a threatened species, and their habitat will continue.

California Condor

California condors are not appropriate as a MIS due to their wide ranging movements and the transient nature of their use of the national forests of southern California. Because California condors are frequently observed off of National Forest System lands, and because the condor recovery program is still in its infancy, it would be difficult to associate population trends with national forest management activities. Monitoring of California condors, as an endangered species, and their habitat will continue.

Least Bell's Vireo

The low elevation riparian habitats preferred by Least Bell's vireo are poorly represented on National Forest System lands, and less than three percent of the regional population of this endangered bird is found on the national forests of southern California (Stephenson and Calcarone 1999). In addition, Least Bell's vireo is a neotropical migrant, and its population numbers are substantially and unquantifiably influenced by conditions found along its flyway and in its wintering habitat. As such, Least Bell's vireo is not appropriate as a MIS. In addition, other species (arroyo toad, song sparrow) have been selected as MIS for the purpose of monitoring the condition of low elevation riparian communities.

Southwestern Willow Flycatcher

Southwestern willow flycatcher are not appropriate as MIS because the are neotropical migrants and they have a limited distribution on National Forest System land, being found only on a small area of the Cleveland National Forest, and at scattered locations on the San Bernardino National Forest. Southwestern willow flycatcher is not found on the Angeles National Forest and may only be present on the Los Padres National Forest in low densities.

California Gnatcatcher

See discussion below under Coastal Sage Scrub.

California Red-legged Frog

California red-legged frogs are not appropriate as a MIS because they are poorly represented on National Forest System lands of southern California. They appear to be extirpated from the Cleveland and San Bernardino national forests, with most of the known populations on the coastal drainages of the northern Los Padres National Forest. Known populations will continue to be monitored due to their status under the Endangered Species Act.

Mountain Yellow-legged Frog

The mountain yellow-legged frog is not selected as a MIS. This frog is not widely distributed on National Forest System land, and where it is present it is mostly within designated wilderness, where little active management activity is occurring.

Arroyo Toad

Short-term fluctuations in arroyo toad populations may not indicate the effects of management actions, being strongly influenced by weather patterns. However, we believe that long-term trends in arroyo toad population's abundance will reflect the effectiveness of management activities in protecting and improving habitat conditions for arroyo toads as well as other riparian dependent species that are susceptible to high levels of human disturbance and habitat degradation. For this reason the arroyo toad is selected as a MIS for monitoring the condition of low elevation riparian communities. Monitoring population trends of arroyo toads will also indicate the effectiveness of management activities in achieving recovery objectives.

Southern Steelhead Trout

Southern steelhead trout are not considered appropriate as a MIS due to their migratory life history. There is no established relationship between southern steelhead population numbers and habitat conditions on National Forest System lands. However, monitoring of southern steelhead will continue at selected locations on the Los Padres National Forest in an attempt to develop information regarding trends in steelhead abundance and Forest Service management.

Shay Creek Three-spine Stickleback

Only one population of the endangered Shay Creek three-spine stickleback is found on the national forests of southern California. This population was established as the result of fish being transported into a formerly unoccupied pond. The long-term status of the Shay Creek unarmored threespine stickleback at this location is uncertain, as it is not clear that the habitat requirements of the fish are met. Therefore, Shay Creek three-spine

stickleback is not appropriate as an MIS.

Unarmored Three-spine Stickleback

The unarmored three-spine stickleback is not appropriate as an MIS because it has a very limited distribution, being found in only one watershed within the Angeles National Forest.

Terrestrial Invertebrates

Threatened or endangered species of terrestrial invertebrates are not considered appropriate as MIS for several reasons: a) monitoring protocols are not well developed for most species; b) often little is known of their habitat relationships; and c) most populations of terrestrial invertebrates vary substantially from year to year in response to environmental factors unrelated to forest management.

Rare, Threatened, and Endangered Plant Species

Many threatened and endangered plant species require only protection of known occurrences and associated habitat. Often their populations do not reflect the effects of management activities, or they possess life history traits that make it difficult to develop and conduct efficient and effective monitoring. In other instances, detectable changes in threatened and endangered plant abundance may not be related to the condition of the community it is presumed to represent. For these reasons, no threatened and endangered plants were selected as MIS. However, populations of many threatened and endangered plant species will be monitored directly.

2. Species with Special Habitat Needs

Species under this group are closely dependent on special habitat elements that may be affected by national forest management. They are considered for selection because they may help us document the effects of management on these special habitat elements and, by extension, other species that also use these elements.

Snag Dependent Species

A significant number of animal species depend on dead trees in various stages of decay for food and shelter. Snag deficits in forested ecosystems can be a local issue of concern in some areas with gentle terrain and high road densities, such as the Mountaintop Ranger District of the San Bernardino National Forest, but recent mortality in conifer stands is producing a surplus of snag habitat that will likely alleviate this concern during the current planning period. Elsewhere on the national forests of southern California, fuel and timber management is not adversely affecting the availability of snag habitat, and therefore there is little need to monitor snag dependent species. Monitoring of snag density will occur directly using information from Forest Inventory and Analysis (FIA) plots.

Use of cavity nesting birds for a MIS, as was done in prior forest plans, is inappropriate because cavity-nesting birds constitute a species assemblage. Though monitoring of cavity-nesting birds can yield information regarding forest management, the use of a species assemblage does not meet the intent of the regulation. In addition, the abundance or quality of habitat for cavity nesting birds is not currently an issue on the national forests of southern California due to the absence of suitable timberlands in the province.

Coastal Marine Species

Coastal marine habitats occur only on the Monterey Ranger District of the Los Padres National Forest. Several marine species are susceptible to disturbance from human visitors, and to some extent the intensity of this disturbance can be controlled by Forest Service management actions. The effectiveness of these management actions is best monitored directly. Because changes in population numbers of coastal marine birds and mammals are not necessarily a reflection of Forest Service management, none of these species was selected as MIS.

Gabbro Endemic Species

Active management is not occurring in most areas dominated by gabbro substrates. Therefore there is no need to designate a MIS for this special habitat type.

Carbonate Substrate Species

No MIS are selected for this habitat type. A monitoring strategy is contained within the carbonate strategy (Carbonate Habitat Management Strategy 2003).

Pebble Plains Species

No MIS are selected for this habitat type. A monitoring strategy is contained within the pebble plain strategy (Pebble Plain Habitat Management Strategy 2002).

Serpentine Substrate Species

Serpentine habitat on the national forests of southern California is largely restricted to the Los Padres National Forest. Areas of high botanical diversity such as Cuesta Ridge, Alder Creek, and Lion's Den have been recognized and designated as botanical special interest areas. Outside of these botanical areas, little in the way of active land management is occurring on serpentine outcrops. Nearly a dozen plant species endemic to serpentine soils have been designated by the Regional Forester as sensitive. Monitoring of these plant species will be done directly as needed in response to project species issues. There is no need to designate a MIS for this habitat type.

Vernal Pool Species

Most vernal pool plants and animals will be conserved if their vernal pool habitat is maintained. In the absence of large-scale disturbance to the pool areas, vernal pool species populations do not reflect the effects of management activities. Where listed fairy shrimp occur no active management is planned. In addition, vernal pool plants and animals often possess life history traits that make it difficult to develop and conduct efficient and effective monitoring protocols. An example of a life history trait that makes monitoring of populations difficult is the ability of most vernal pool organisms to enter into lengthy periods of dormancy. For these reasons, no vernal pool plants or animals were selected as MIS.

Cliff Species

Little active management is planned for this habitat type. The peregrine falcon was formerly considered an MIS due to its status as a threatened species and due to its dependence on cliff habitat. The peregrine falcon is no longer listed as threatened and is now designated by the Regional Forester as sensitive. The peregrine falcon only occurs on a portion of the Los Padres National Forest. Because the peregrine falcon is no longer listed as threatened, has a restricted range on the national forests of southern California, and because its abundance is not directly related to national forest management activities, it is not selected as a MIS.

Because little active management is planned for the cliff habitat type no MIS are selected for this community.

Mine, Cave, and Crevice Species

Little active management is planned for this habitat type. Abandoned mines within the national forests known to harbor bat species are secured with bat-friendly gates that help prevent human disturbance to bat hibernacula. Therefore, no MIS, including Townsend's big-eared bats, are selected for this habitat type.

Landscape Level Habitat Integrity and Linkage-dependent Species

The mountain lion is selected as a MIS to monitor the effects of Forest Service management activities on landscape level habitat fragmentation and habitat linkages. The mountain lion is the largest carnivore in the province, and it requires large core habitat areas, abundant prey, and habitat connectivity between subpopulations. We believe that interagency, inter-forest monitoring of mountain lion populations can be used to estimate the effects of national forest management on mountain lion abundance, and that trends in mountain abundance can be an indicator of the condition of biological communities at the landscape level.

Cypress Forest Species

Little active management is planned for this habitat type. Therefore, no MIS are selected for this community.

Riparian Species

Arroyo toad and song sparrows are selected as MIS for riparian habitats.

Arroyo toad - see above

Song sparrow - The song sparrows is selected as a MIS for riparian areas because its abundance is expected to be responsive to management actions, as well as indicating trends in the status of the biological community. For example, song sparrow abundance is negatively correlated with the use of riparian understories for grazing and recreation (Marshall 1948) and positively correlated with the abundance of herbaceous vegetation (Ballard and Geupel 1998).

"Riparian bird assemblage" was not selected as a MIS for riparian habitats. Riparian bird assemblage is not a

species, and monitoring of a species assemblage does not meet the intent of the regulation. The species comprising the "riparian bird assemblage" were reviewed and from among those species we selected the song sparrow for the reasons described above. In addition, although not part of our current MIS monitoring strategy, monitoring of the abundance and distribution of focal riparian species will continue on the Cleveland and Los Padres National Forests and part of this monitoring work is intended to determine if some subset of the overall riparian bird community can be used as an indicator for riparian vegetation or for endangered bird species. This monitoring of riparian bird species is expected to inform forest planners regarding the need for any future Forest Plan amendments or revisions.

The arboreal salamander is not selected as a MIS for riparian or any other habitat type. The arboreal salamander is difficult to detect, and determining trends in its population abundance would be time-consuming if even possible. There are no well-established habitat relationships or survey protocols for arboreal salamander that would allow us to determine that changes in population abundance are related to forest service management actions.

The foothill yellow-legged frog is not selected as a MIS because it is currently found only on the northern portions of the Los Padres National Forest.

The California leaf-nosed bat is not appropriate as a MIS for riparian habitats. The distribution of California leaf-nosed bats on southern California National Forest System lands is poorly known, and the species has rarely been detected despite recent survey efforts. Populations of California leaf-nosed bats cannot be effectively and efficiently monitored.

The western pond turtle is not appropriate as a MIS. Although they are riparian dependent, western pond turtles are habitat generalists that can occur in a wide range of riparian habitats and associated uplands. This makes it difficult to relate changes in pond turtle abundance to national forest management activities.

Aquatic Species

A number of fish species were previously designated as MIS on one or more of the national forests of southern California: Steelhead trout, rainbow trout, Santa Ana sucker, speckled dace, Mohave tui chub, and arroyo chub. These species are not appropriate as MIS for several reasons. First, sampling variability for stream and riverine fish is high, making determination of population trends difficult. Second, in many instances fish species are sensitive to habitat changes arising from off-forest influences, and their ability to move between private and national forest lands, in many cases, makes it difficult to attribute population changes to national forest management activities. The six fish mentioned above are included in the "native fish assemblage" and collectively with the other fish that comprise this category are no better as MIS than they are singly. In addition, the "native fish assemblage" is not a species and therefore not appropriate as a MIS.

Montane Meadow Species

No MIS are selected for montane meadows. A monitoring strategy for this community is described in the meadow habitat management strategy.

Grassland Species

The American badger is not selected as a MIS because its distribution on National Forest System lands is spotty and not well documented. The species is somewhat of a habitat generalist, and changes in American badger abundance are not likely to be related to management actions on National Forest System lands.

3. Species that are Hunted, Trapped, and Fished

Species considered under this category include deer, turkey, quail, fish and other harvestable species that are in high public demand for consumptive uses. Demand MIS are used to help assess effects of management on meeting this demand on national forests. Drawing inference about the effect of national forest management on these species is difficult, because, in large part, their populations are regulated by the state through harvest regulations. Nevertheless, species in this group may be appropriate as MIS where the role of harvest regulation and demand can be evaluated along with habitat trends. This situation will normally occur where the California Department of Fish and Game collaborates in the monitoring effort.

Mule Deer

The mule deer is selected as a MIS. Although trends in mule deer populations are difficult to detect, we believe

they can be determined through cooperation with the California Department of Fish and Game. Observed changes in mule deer abundance may not be due entirely to the effects of Forest Service management. This lack of a precise cause-and-effect relationship is due to the complex interrelationship between deer herd size, hunting pressure, human developments and roads, and vegetation management practices on private wildlands. However, we recognize that mule deer population trends are in large part dependent on Forest Service vegetation management activities. Because providing suitable deer habitat is an important management objective for the national forests of southern California, it is important for the Forest Service to engage in inter-agency monitoring efforts of deer population abundance. In addition, mule deer can be used to evaluate the effects of different strategies in forest plan alternatives for vegetation and road management.

Black Bear

The black bear is not selected as a MIS. Black bear populations fluctuate widely in response to annual variations in the number of bears harvested by hunters. It would not be efficient or effective to attempt to relate changes in black bear abundance to the effects of forest service management. In addition, black bears are habitat generalists, making it doubly difficult to relate changes in black bear abundance to Forest Service management actions.

Gray Squirrel

The gray squirrel is not selected as a MIS. Gray squirrel numbers fluctuate widely in response to annual variation in mast production. Given that mast production is largely climate-related and independent of Forest Service actions, it would not be efficient or effective to attempt to relate changes in gray squirrel abundance to the effects of Forest Service management.

California Quail

The California quail is not selected as a MIS. California quail numbers fluctuate widely in response to annual variations in weather and can also vary due to annual variations in mortality rates from predators and hunters. It would not be efficient or effective to attempt to relate changes in California quail abundance to the effects of Forest Service management.

Turkey

The turkey is not selected as a MIS. Turkeys are not native to southern California, and their abundance fluctuates widely in response to annual variations in mast production. Turkey populations can also vary due to annual variations in mortality rates due to predators and hunters. It would not be efficient or effective to attempt to relate changes in turkey abundance to the effects of Forest Service management.

Game Fish

Rainbow trout are not appropriate as a MIS. As described above for other native fish species, changes in rainbow trout populations do not primarily reflect the effects of national forest management activities since most populations are susceptible to harvest under state fish and game regulations and to changes in habitat resulting from non-Forest Service administered water diversions. For similar reasons, the non-native brown trout and the non-native largemouth bass are not appropriate as MIS.

4. Non-game Species of Special Interest

Species considered under this category are those for which there exists special public interest for non-consumptive reasons. They may be selected for the purpose of focusing assessment on such species when management is expected to have a major influence on their populations. Public interest in non-game species is typically generalized, such as interest in wildflowers, birds, and other wildlife for viewing or nature study. Interest in any one species is not sufficient to drive MIS selection, beyond those species already selected under other categories. Those species cover the special interests that are to be considered under this category.

Red Diamond Rattlesnake

The red diamond rattlesnake is not considered appropriate as a MIS. Red diamond rattlesnakes are known to use a variety of habitats and to occur in a wide range of habitat conditions, and they do not appear to be particularly vulnerable to activities on National Forest System lands.

5. Species that Indicate Effects to Major Biological Communities

Species considered under this category are those whose populations respond to management-induced changes in

key ecological conditions within a community. These ecological conditions should be important to other members of the community as well. Selection of MIS under this category helps focus attention on maintenance and restoration of desired conditions within major biological communities.

Oak Woodland/Savanna

Blue oak, Engelmann oak, and valley oak are selected as MIS for this habitat type. Lack of oak regeneration has been identified as a problem in this vegetation type, attributed to livestock grazing, competition from non-native annual grasses, and unnatural abundance of some acorn-eating animals such as gophers and ground squirrels (Borchert et al. 1989, Pavlik et al. 1991). Monitoring abundance of these species, particularly saplings, will indicate whether Forest Service management has been successful in creating conditions favorable for oak regeneration and, in consequence, maintenance of this habitat type.

Coastal Sage Scrub

Bell's Sage sparrow is not selected as MIS because the habitat it represents – partial to pure stands of chamise chaparral and low, open stands of coastal sage scrub – does not appear to be at risk from activities carried out on the national forests of southern California. Rather than using the Bell's sage sparrow as an indicator of the effects of habitat fragmentation we are proposing to use the Mountain lion.

Coast horned lizard is not selected as a MIS. The primary threat to the coast horned lizard is the loss habitat from urban development and the degradation of habitat near urban development due to the introduction of Argentine ants and domestic cats. On the national forests of southern California, coast horned lizards are generally found wherever there are low gradients and sandy soil. As a habitat generalist, Forest Service management activities are not expected to measurably affect coast horned lizard populations.

The Los Angeles pocket mouse is not selected as a MIS. There have not been any recent collections or observations of the Los Angeles pocket mouse on National Forest System land, and the species is only suspected to occur on the Angeles and San Bernardino National Forests due to the presence of potential habitat and historic collections from on and near National Forest System land. The Los Angeles pocket mouse occurs predominantly off of National Forest System land and its populations are minimally influenced by activities on the national forests.

California gnatcatcher is not selected as a MIS for coastal sage scrub because it occurs only in a portion of the habitat type across the province (i.e. it is not found on the Los Padres National Forest or most of the Angeles National Forest). Also, as discussed earlier, known California gnatcatcher populations will be monitored as part of the forests' threatened and endangered species programs.

Chaparral

The size and distribution of plant and animal populations in chaparral communities are subject to large natural fluctuations due to annual variations in rainfall and period disturbance resulting from fires, landslides, and floods. In order to address species diversity in chaparral, chaparral vegetation will be directly monitored for trends in the sizes and ages of vegetation patches.

"Chaparral bird assemblage" is not appropriate as a MIS. "Chaparral bird assemblage" is a species group, and though monitoring of chaparral birds can yield information regarding forest management (primarily effects of prescribed fire programs), the use of a group of species does not meet the intent of the regulation.

Big-cone Douglas-fir Forest

Big-cone Douglas-fir is selected as the MIS for this habitat type. Altered fire regimes are affecting the abundance and distribution of this tree and the vegetation series of which it is the dominant constituent element. The big-cone Douglas-fir habitat type is one that will be a major focus of vegetation management projects, and the big-cone Douglas-fir trees themselves are an obvious and appropriate indicator of the successful restoration and maintenance of this community.

Montane Conifer Forest

The California spotted owl, California black oak, Coulter pine, and white fir are selected as MIS for the montane conifer forest habitat type. These species are selected because their populations and their population structure are indicators of the condition of montane conifer forests. A territorial species with large acreage requirements (at least 300 acres of mature forest per pair), the California spotted owl is an indicator of mature conifer forest with a

dense, multi-layered canopy (Stephenson and Calcarone 1999). Monitoring the California spotted owl will indicate the effectiveness of management activities in achieving maintenance and restoration of this type of montane conifer habitat. Black oak, on the other hand, is a gap-phase species that requires occasional openings in the forest canopy in order to regenerate; its acorns are also an important food source for many forest animal species (California Department of Fish and Game 2002). Abundance of black oak and Coulter pine, especially saplings, will indicate progress toward reducing forest stand densities and creating regeneration opportunities for light-requiring species. The abundance of shade-tolerant white fir has increased with the success of fire suppression in montane conifer forests (Stephenson and Calcarone 1999); thus it acts as an indicator of forest stand densification. Reduced abundance of white fir in conifer stands dominated by ponderosa pine will indicate a return to more historic stand conditions. Taken together, population trends of these three species will indicate progress toward achieving montane conifer forests that contain large patches of mature trees with reduced stem densities, interspersed with canopy gaps providing opportunities for regeneration of light-requiring species, including ponderosa pine.

"Conifer and oak woodland bird assemblage" is not selected as a MIS. "Conifer and oak woodland bird assemblage" is a species group, and though monitoring of conifer and oak woodland birds can yield information regarding forest management, the use of a species group does not meet the intent of the regulation.

The southern rubber boa is not selected as a MIS. Changes in rubber boa populations are difficult to detect, and any measured changes are not necessarily due to forest management (Hoyer, personal communication). The primary threats to southern rubber boas are loss of habitat from rural development and degraded habitat due to presence of domestic pets, both factors outside the control of national forest management.

The northern flying squirrel is not selected as MIS. The northern flying squirrel has a very limited distribution on the national forests of southern California, and where it does occur it is difficult to detect. Trends in the abundance of northern flying squirrels cannot be efficiently and effectively determined.

Pinyon/Juniper Woodland

The pinyon/juniper bird assemblage is not selected as a MIS. Pinyon/juniper bird assemblage is a species group, and though monitoring pinyon/juniper woodland birds can yield information regarding forest management, the use of a species group does not meet the intent of the regulation.

In summary, 12 species have been selected as management indicator species for the revised forest plan (see table 433: Southern California forest plan revision - management indicator species). They will be used to assess effects of alternatives and to help monitor effects of implementing the selected alternative.

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General Direct and Indirect Effects to Plants and Animals

General Direct and Indirect Effects to Plants and Animals

A=All Species; B=Birds; F=Fish; H=Amphibians; I=Insects; M=Mammals R=Reptiles, T=Terrestrial

Watersheds

Physical Effect

Watershed improvement, wildlife habitat enhancement or restoration, and post-fire Burned Area Emergency Rehabilitation (BAER) activities occur in all kinds of habitats. Activities can include structural and non-structural improvements. They include channel treatments within stream or river channels, hill slope treatments on upland areas, erosion control, controlling or re-routing access, revegetation, etc. Some specific activities include installing bank stabilization structures; building check dams; excavating retention basins; excavating structure placement sites; diverting stream flow; placing erosion control material such as silt fences, erosion matting, hay bales, straw mulch, broadcast seeding; installing in-ground water tanks (guzzlers); removing vegetation; dropping snags for use as log erosion barriers; cutting and planting willow stems; removing small dams. Watershed activities sometimes involve cooperative efforts with adjoining landowners.

The following effects may be associated with watershed or habitat enhancement projects and may cause loss of individuals or habitat. The species that are affected by watershed improvement and enhancement related activities are noted parentheses below.

Negative Effects:

- Short-term reductions in water quality due to increased sedimentation during structure building and placement (B F, H, I)
- Mortality to downstream eggs, larvae, or fry due to increase in sedimentation during structure building and placement (F, H) (B, I)
- Short-term loss of vegetation (A)
- Introduction of non-native or non-local plant species (A)
- Mortality or injury due to entrapment in erosion cloth material (B,T,H)
- Mortality due to trampling, burying, or stranding of individuals (F, H, P, T)
- Short-term displacement by disturbance/noise during project (B, T, H, F)
- Mortality due to drowning in water-catchments (guzzlers) (M)

Positive Effects

- Long-term reduction in sedimentation and erosion (A, P)
- Increased habitat quality, animal distribution and suitable habitat (A)

Biological Effect

Pest Management

Activities associated with pest management may include the use of physical, chemical, mechanical and biological controls. Examples of such activities include: mistletoe removal through pruning (mechanical); application of pesticides (chemical) to control broom, thistle, *Arundo* and/or tamarisk, (physical) prescribed fire to control exotic annual grasses and use of grazing livestock to control pest plants, mosquito fish release for mosquito larvae control (biological). Post treatment restoration is often a component in pest management programs.

The following effects may be associated with pest management projects and may cause loss of individuals or habitat. The species that are affected by pest management related activities are noted parentheses below.

Negative Effects

- (Short-term) Direct removal/destruction of habitat (A)
- (Short-term) Direct removal/destruction of organisms (A)
- Degradation of habitat via pesticide use (A)
- Competition/predation of non-native species (bio-control) on native species (A)

Positive Effects

- Restoration and/or enhancement of habitat (A)

Prescribed Fire

Prescribed burns are used as a resource management tool to reduce fuel loads and restore habitat on all of the four southern National Forests. Prescribed burn size may vary. Human activities associated with prescribed burning include creating fire lines (the removal of vegetation by chainsaw or dozer to mineral soil) around a project area where no natural barriers exist, brush pile burning, staging areas for crews and equipment, water diversion from stream, lakes or ponds for fire control, smoke from fire, retardant applications to the landscape and burning of vegetation. The effects of fire to natural systems may also be considerable.

The following effects may be associated with prescribed fire projects and may cause loss of individuals or habitat. The species that are affected by prescribed fire related activities are noted parentheses below.

Negative Effects

- Loss of individuals through burning (A)
- Direct removal/loss of habitat. (Includes stand reducing fires (A)
- Degradation or loss of habitat through escaped fire (Includes stand reducing fires.)
- Degradation or loss of habitat through excessive fire intensity. (soil temperatures, chemistry) (A)
- Erosion caused by alteration of surface hydrology, slope instability and soil loss (A)
- Crushing and trampling of organisms and habitat by off-road vehicles and foot traffic used by fire personnel during project implementation (A)
- Erosion from post-fire unrestricted vehicle use (motorized and non-motorized), foot traffic and equestrian use (A)
- Short term displacement from noise and smoke (B, T, I)
- Short term increase in sedimentation from loss of vegetation and retardant use. (H, F)
- Short term loss of in stream flow from water use (H, F)
- Nesting disturbance by helicopters and aircraft (B)
- Habitat degradation by spread of invasive species (A)

Positive Effects

- Reduced fire size and intensity from wildfires; lower mortality compared to catastrophic wildfire event (A)
- Habitat enhancement from early seral stage, creating vegetation mosaics, nutrient cycling and possible increase in forage quantity and quality with change in habitat structure (A)

Wildfire

Wildfires originate from lightning, escaped campfire, escaped burns, accidental vehicular fire and arson. Fire size

and intensity varies. Generally to protect natural resources and human life and safety, wildfire is aggressively controlled whenever possible. Activities associated with fighting wildfire include creating fire lines (removing vegetation with hand tools, chainsaws or dozers to mineral soil); creating fire breaks and temporary roads (removal of vegetation using a dozer or other heavy equipment to mineral soils); water drops from helicopters and tanker; aerial fire retardant application to the landscape; water diversion for fire fighting (including suction removal) water from streams, lakes and ponds. The effect of fire to natural systems may be considerable.

The following effects may be associated with wildfire related projects and may cause loss of individuals or habitat. The species that are affected by wildfire and firefighting related activities are noted parentheses below.

Negative Effects

- Direct removal/loss of individuals through burning (A)
- Direct mortality from accidental fire retardant drops in streams (F,H)
- Direct removal/loss of habitat. (A) (Includes stand reducing fires.)
- Degradation or loss of habitat at concentrated use areas, and through escape fire or extreme fire intensity. (Includes stand reducing fires.) (A)
- Degradation or loss of habitat through excessive fire intensity. (soil temperatures, chemistry) (A)
- Erosion caused by alteration of surface hydrology, slope instability and soil loss (A)
- Erosion caused by slope instability and soil loss (A)
- Crushing and trampling of organisms and habitat via unrestricted vehicle use (motorized and non-motorized) and foot traffic by fire personnel during fire fighting activities (A)
- Accelerated erosion from post-fire unrestricted vehicular use (motorized and non-motorized) and foot traffic, dozers, containment lines and or equestrian use. (A)
- Short term displacement from noise and smoke (B, T, I)
- Short term increase in sedimentation rates from loss of vegetation and retardant use causing egg and larvae suffocation (H, F)
- Short term loss of in stream flow from water use during fire fighting activities. (H, F)
- Nesting disturbance by helicopter (B)
- Habitat degradation by spread of invasive species (A)
- Fragmentation of habitat (short term.) (H, B, T, I)
- Habitat type conversion by increase in fire frequency (A)

Positive Effects

- Habitat enhancement from early seral stage, creating vegetation mosaics, nutrient cycling and possible increase in forage quantity and quality with change in habitat structure (A)

Public uses and designations

Land ownership

Wildlife Corridors/Landscape Connectivity

As open space is developed for highways, houses and other infrastructure needs outside of National Forest Service boundaries, animals that require large territories for dispersal and feeding (eg: mountain lions, deer) are denied corridors for movement between suitable habitat. This landscape connectivity has a profound effect on species diversity and success is a major issue, crossing all ownership boundaries. Many of the larger animals, i.e. mountain lion, deer, will encounter impediments to the dispersal of their young adults and may even face shortage of prey and browse materials as development, continues to be developed. Existing roads have fragmented the landscape making the link between large tracts of undeveloped lands difficult to assess for these species.

Migration movements and dispersal are impeded.

National Forest activities effecting landscape connectivity are transportation routes and associated functions and lands activities such as changes in land holdings through acquisition, exchange, donation or conveyance, or purchase exchanges. Activities associated with lands primarily include acquisition of National Forest System lands. Acquisition of lands occurs through exchange, donation or purchase. An acquisition is a purchase of lands; an exchange involves trading NFS acres to another party for acres that are added to the National Forest System; in a land donation, lands are given to be added to the NFS National Forest System to mitigate adverse affects elsewhere or for other reasons, i.e. tax write-off, or estate planning; and in a land conveyance NFS are given away. Conveyance is not required when land are purchased by the Forests with government funds to be added to the National Forests. Only rarely is land declared surplus and sold.

The following effects may be associated with lands activities and may cause loss of individuals or habitat. The species that are affected by related lands activities are noted in parentheses below.

Acquisitions, exchanges, donations

Negative Effects

- Generally no adverse effects from lands acquired (A)
- May be difficult to manage effectively along the urban interface without appropriate controls and barriers (A)
- The urban interface or heavily populated in-holdings may be more susceptible to introduction of exotic species and other human impacts such as fire frequency and trespass (A)
- Lands acquired are occasionally in need of restoration, which could have a long-term beneficial effect on species, and may have short-term negative effects from resulting restoration work. (i.e., erosion during restoration work, use of herbicides to control undesirable, non-native invasive species, or noxious weeds, use of equipment - direct mortality of animals or plants, noise) (A)
- Alteration of (including improved/increased) surface hydrology (A)
- Alteration of (including improved/increased) subsurface/groundwater hydrology (A)
- Alteration of local microclimate through vegetation removal (e.g. soil temperatures) (I)
- Crushing and trampling of organisms and habitat via vehicular, mechanical treatment or foot travel (H,PI)
- Direct loss of eggs, larvae and adults from trout predation (H,F)

Positive Effects

- Lands acquired can increase the net habitat for species (A)
- Reduced or improved slope stability, and accelerated or reduced soil loss (H,P,F)
- Improved habitat capacity with decreased non-native species predation and competition (H,F)
- Loss and reintroduction of organisms via revegetation/restoration (P)
- Loss of habitat in parcels disposed of, (Conveyance of land (A)
- Loss of corridors used for migration and dispersal, (Conveyance of land) (A)
- Less ability to manage surrounding National Forest System lands effectively by isolating parts of the National Forest from the rest, (Conveyance of land) (A)

The following effects to landscape connectivity may be associated with transportation corridors (roads) and may cause loss of individuals or habitat. The species that are affected by transportation related activities are noted parentheses below.

Transportation

- Habitat fragmentation by transportation corridors and associated culverts/water control devices. (railroads, access roads, highways and freeways) (A)
- Loss of habitat from transportation construction activities: sedimentation, loss of vegetated habitat. (mowing and/or clearing) (A)
- Loss/injury due hazard material spills from equipment, (oil, gas, or chemicals) (A)
- Increased risk of Hazmat spills along transportation corridors, train derailments and truck crashes (A)
- Increased risk of species removal by forest users via transportation corridors (A)
- Species disturbance and displacement due to noise (B, T, H)
- Crushing by vehicles, equipment, trucks, and trains (A)
- Introduction of non-native species. (revegetation plantings, domestic animal abandonment, exotic weed seeds transferred by motorized/mechanized vehicles) (A)
- Increased risk of wildfires and associated loss of habitat and individuals (A)

Facilities : buildings, water tanks, construction materials, disposal sites.

The following effects may be associated with facilities and may cause loss of individuals or habitat. The species that are affected by facilities and facilities related activities are noted parentheses below.

- Direct mortality or injury from crushing of individuals by heavy equipment used to repair and/or maintain facilities (check dams and water tanks in particular) (A)
- Direct mortality as a result of spillage of gas and/or oil into streams within and downstream from occupied habitat (H, F,I, R)
- Short-term displacement of individuals due to noise from facilities maintenance activities (B, F, H, M, R)
- Long-term loss of habitat as a result of facilities maintenance and repair/reconstruction (i.e., check dams and water tanks) (H, F, B)
- Disruption of breeding activity as a result of noise associated with facilities maintenance, repair and reconstruction (H, F, B)

Recreation

General Forest Recreation Effects

General forest recreation activities are functions visitors undertake in developed National Forest recreation sites and facilities, excluding permitted events. This type of activity occurs often, and may be concentrated into small geographical areas, such as stream sides, streams and other sensitive areas. Activities can include: cross country horseback riding; hiking; rock climbing, snow play; hunting; fishing; dispersed camping; train watching; non-consumptive wildlife, plant and fish viewing (i.e., bird watching); driving; picnicking and barbequing; mountain biking; target shooting; berry picking; beach play; and water play (covered in the water play activities section). Some chronic illegal activities also occur, sometimes in association with general forest recreation activities. These illegal activities include: marijuana gardens, paint ball shooting, drug labs, parties, graffiti, domestic animal abandonment; fireworks, trash dumping and un-permitted collecting of rocks, fossils, plants, animals, and insects.

There are effects associated with general forest recreation that should be considered across all landscapes and Forests. Litter generated by visitors besides being attracts generalist native species such as ravens, skunks, raccoons and bears. These species increase in population due to the food available and can affect “species of concern” through competition and predation. Litter also attracts non-native species such as English sparrows, pigeons, feral cats, dogs and pigs. These non-native species can also affect “species of concern” through increased predation, displacement, competition for food, space, and water. Litter can directly kill animals by entrapment or ingesting of plastics, metal and glass; kill plants by burying them; and can introduce non-native weed seeds.

Off-road driving and blazing new trails by car, horse or foot also occurs during general forest recreation activities. New trails are created when Forest users driving off road for recreation, camping, hiking access, gathering forest products, and become attractive to later users for travel. These “social” roads and trails often occur in inappropriate areas and are not planned or properly engineered. As a result these sites suffer from erosion, direct habitat loss, mortality of species individuals, and indirect impacts (vectors for non-native species, sedimentation).

The following effects may be associated with general forest recreation related projects. The species that are affected by general forest recreation are noted in parentheses below.

Cross-country horseback riding may cause loss of individuals or habitat by:

- Exotic plant introduction from horse manure and feed (A)
- Soil compaction and erosion (F,H, R)
- New trail starts (A)
- Grazing of plants (I)
- Trampling of plants, stream banks and animals (A)
- Disturbance of animal burrowing or nesting nearby (B,H, M, R)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Hiking - may cause loss of individuals or habitat by:

- Soil compaction (A)
- New trail starts that can damage vegetation and encourage illegal use (A)
- Trampling of plants and animals (A)
- Erosion and sedimentation on non-designated and un-maintained trails (H,F)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Disturbance/death/injury of animals by dogs that may accompany hikers (A)

Snow play - - may cause loss of individuals or habitat by:

- Erosion in areas exposed from excessive use (B, F,H)
- Damage to surrounding vegetation (A)
- Snowmobiles may cross streams causing erosion at crossings (B,F,H)
- Possible toxic substance introduction into streams from snowmobiles (F,H)
- Noise disturbance that can displace animals (B, M)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Hunting -- may cause loss of individuals or habitat by:

Negative effects

- Driving off road /unauthorized trails damage vegetation and encourage illegal use (A)
- Shooting of unintended targets (A)
- Damaged vegetation from shooting (B,I,P,M)
- Lead shot consumed becoming toxic to animals (B, M)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Positive Effects

- Removal of non-native pest species (feral pigs) (A)

Fishing - may cause loss of individuals or habitat by:

Negative effects

- Trampling of riparian vegetation reducing shade, increasing erosion, host plants for food sources (B, F,H, I)
- Collecting of rare fish for bait (F)
- Stocking of non-native game species (trout) that can be compete/prey on native aquatic species (F,H)
- Travel (driving and walking) through streams causing erosion, disruption of redds and egg masses, direct kill of eggs and young fish, sedimentation (F,H)
- Introduction of non-native bait fish that compete/prey on the native aquatic species(F,H)
- Filament fishing lines and lures left behind can trap or injure animals (B,F,H,M)
- Lead fishing weights toxic to species if ingested (B, M)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Positive Effects

- Control/removal of non-native fish that compete with native aquatic species (B, F, H, R)

Dispersed camping-- may cause loss of individuals or habitat by:

- Off road driving creating erosion
- Camping sites may disturb or destroy animals (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Train watching - may cause loss of individuals or habitat by:

- Introduction of exotic plant species (A)
- Ground clearing (A)
- Irrigation for shade trees (A)
- Driving off roads (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Non-consumptive wildlife, plant and fish viewing - may cause loss of individuals or habitat by:

- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Mortality to individuals by off-road driving (A)
- Harassment of animals, disturbance of habitat (H,B,F,M)
- Trampling of plants and animals (A)

Driving - may cause loss of individuals or habitat by:

- Mortality of individuals by vehicles, on roadway and off-road (A)
- Indirect disturbance by vehicles to plants and animals may affect feeding, breeding and resting behaviors (A)
- Short term displacement from noise disturbance (H,B,F,M)

Picnicking and Barbequing- may cause loss of individuals or habitat by:

- Indirect disturbance or mortality of animals and plants (A)
- Mortality to individuals by off-road driving (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Short term displacement from noise disturbance (B,F,H,M)
- Campfire caused smoke that can disturb animals, and can cause wildfires. Wood collection can disturb wildlife and habitat (A)
- Trampling of plants and animals (A)

Mountain biking-may cause loss of individuals or habitat by:

- Loss of habitat by creating new trails (A)
- Erosion from off trail riding (F,H)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Indirect disturbance of animals and plants (B,M,H)
- Trampling of plants and animals (A)

Target shooting- may cause loss of individuals or habitat by:

- Shooting of animals and plants (B,M)
- Vegetation disturbance and destruction (B,M)
- Mortality of individuals by off road driving (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Noise disturbance leading to short-term displacement (B,M)
- Lead dust causing soil toxicity (A)
- Lead shot poisoning with animal consumption (B, M)
- Cleared parking/shooting areas contribute to soil erosion and sedimentation (A)

Berry picking-- may cause loss of individuals or habitat by:

Direct disturbance of nesting birds (B)

- Vegetation destruction (collateral damage) (A)
- Trampling of plants and animals (A)
- New trails made creating erosion and increase access to sensitive species habitat (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Loss of berries as a food source (B,M)

Rock climbing--may cause loss of individuals or habitat by:

- Disturbing nesting birds, leading to nest abandonment, territory abandonment, chick mortality (B)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Effects of chronic illegal activities include:

- Erosion from illegal structures and roads associated with drug operations and clean up activities (A)
- Hazardous materials spills, (drug labs and graffiti) (A)

- Water diversion for irrigation (Marijuana plantations) (A)
- Increased predation and competition from feral domestic animals (B, H, M, R)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Dumping (this can include dumped vehicles, furniture and household appliances) (A)
- Fire starts/wildfires, and associated destruction of habitat, plants and animals (A)
- habitat modification or destruction (A)
- harassment of animals, noise disturbance (A)
- trampling and soil compaction (A)

Law Enforcement Activity Effects

Law Enforcement activities can occur throughout National Forest System lands and all times of the day. Activities associated with law enforcement include low-level flights by helicopters, securing and dismantling methamphetamine labs, removal of marijuana plantations, trailblazing, excavation of investigation sites, search and rescue operations, removal of dumped vehicles, household trash and hazardous material cleanup.

The following effects may be associated with Law Enforcement related projects and may cause loss of individuals or habitat. The species that are effected by Law Enforcement are noted in parentheses below.

Negative Effects

- Disturbance to nesting or roosting birds from low-flying helicopters and aircraft (B)
- Abandonment of habitat during prolonged disturbance (H,M,B,I, R)
- Trampling or loss of vegetation (A)
- At stream crossings, mortality of eggs, larvae or individuals from crushing, covering or dislodging into the stream flow eggs or larvae (H, F, B)
- Destruction of burrows or plants during excavation (M, H, P,I, R)
- Introduction of toxic materials from drug labs during drug manufacturing, raids or lab clean-ups (A)
- Increased sedimentation from trails and roads blazed or soils exposed during activities (A)
- Crushing and trampling of organisms and habitat via off road vehicular use and foot traffic (A)
- Erosion from unrestricted vehicle use (motorized and non-motorized) and foot traffic, and/or equestrian use (A)
- Short term displacement from noise (B, I, M)
- Behavioral changes from periods of night lighting (A)

Positive Effects

- Halting illegal use of herbicides and pesticides (A)
- Removal of exotic plants (A)
- Removing illegal water divisions (A)

Military Exercises/Search and Rescue Exercises

Military exercises and Search and Rescue Exercises activities can occur throughout National Forest System lands and all times of the day. Activities associated with these uses include low-level flights by helicopters, trailblazing, off-road driving, rock climbing, the use of explosives and flares and heavy foot traffic. Forests near areas with military training camps and troop populations are likely to receive multiple requests to use forest lands as training sites.

The following effects may be associated with Military exercises and Search and Rescue Exercises. The species that are affected by Military exercises and Search and Rescue Exercises are noted in parentheses below.

Military exercises/Search and Rescue exercises may cause loss of individuals or habitat by:

- Death/injury from impacts with mechanized and motorized vehicles and weapons (A)
- Disturbance to nesting or roosting birds from low-flying helicopters and aircraft (B)
- Rock climbing may disturb nesting birds, leading to nest abandonment, territory abandonment, chick mortality (B)
- Habitat abandonment due to noise (B, H, I, M, R)
- Litter (attracts nuisance species/ingestion of plastic/animal entrapment) (A)
- Night lighting interfering with behavior (A)
- Human disturbance to animals that affects feeding, breeding and resting behaviors, particularly in riparian areas (A)
- Trampling of plants and animals (A)

Recreation Residences

Recreation residence tracts generally consist of small privately owned cabins situated on National Forest System lands. They are often situated in riparian areas. Use of public land by the cabin owners is authorized by permit for up to 20 years. Cabins are intended for weekend, vacation, or seasonal use only. Restrictions exist regarding activities related to the cabin and surrounding lands including: adding additions to the structure, adding additional structures and roadways, landscaping, water diversions, and septic systems.

The following effects may be associated with recreation residence related projects. The species that are affected by recreation residence activities are noted in parentheses below.

Recreation residences may cause loss of individuals or habitat by:

Negative Effects

- Losses through trampling adjacent to the sites (A)
- Habitat degradation by spread of non-native/landscape plants (A)
- Disturbance/injury/death from domestic pets/cats and dogs (A)
- Losses of habitat from existence of cabins, maintained yards, parking areas, access roads, especially in riparian areas (A)
- Habitat losses to social trails (hiking and mountain biking) between cabin and adjacent forest areas (A)
- Noise disturbance (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Changes in local water table levels water diversions for domestic use affecting available surface water and influencing riparian vegetation viability. (A)
- Impacts of leach fields, septic tanks, and/or holding tanks on ground water and streams (A)
- Poisoning/death from pesticide use or rodent eradication efforts in/around cabins (A)
- Behavioral changes from prolonged periods of night lighting (A)

Positive Effects

- Cabin owners monitor the area and assist the FS in tract management (A)

Off Highway Vehicles (OHV) - Open Areas Effects

Activities associated with OHV open area use include: designated and undesignated stream crossings; vehicles use in active stream channels; hill climbing; vehicles use on designated and undesignated trails, creating new trails, track making, picnicking, and OHV trials activities.

The following effects may be associated with OHV/Open Areas related projects. The species that are effected by OHV/Open Areas activities are noted in parentheses below.

OHV/Open area activities- may cause loss of individuals or habitat by:

- Direct mortality or injury from crushing of individuals by operating OHVs on designated/undesignated roads and trails and open space within occupied habitat (H, I, M, R)
- Direct mortality or injury from crushing of individuals by operating OHVs in streams and riparian corridors in occupied habitat (H, F)
- Direct mortality or injury as a result of spillage of gas and/or oil into streams within and downstream from occupied habitat (H, F)
- Direct mortality or injury of eggs and tadpoles as a result of added sedimentation and/or suspension by wave action from OHV use within stream courses or at designated/undesignated crossings (H, F)
- Reduced habitat quality due to noise, presence of OHVs and people (B, F, H, M, R)
- Interference with and/or loss of breeding activity (displacement) as a result of noise and presence of OHVs and people (H, F, B)
- Habitat degradation by spread of non-native in disturbed/denuded areas (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Campgrounds and other Developed Sites Effects

Activities associated with the use, maintenance or construction of campgrounds and other developed recreation sites (picnic areas, trail heads) include: initial site construction, clearing of vegetation, grading of sites, asphalt and concrete installation (non-permeable surfaces); site maintenance and cleaning; visitor camping, campfires, lights, picnicking, fishing, water play (see section III), photography, playing of radios/music; pets; collecting rocks, plants and animals; releasing exotic species; hiking and biking.

The following effects may be associated with campgrounds and other developed sites related projects. The species that are effected by campgrounds and other developed sites are noted in parentheses below.

Campgrounds and other developed site effects - may cause loss of individuals or habitat by:

- Death of individual organisms and habitat destruction by trampling (B, H, I, M, R)
- Runoff and erosion due to non-permeable surfaces (asphalt/concrete) and soil compaction (A)
- Habitat abandonment due to noise (B, H, I, M, R)
- Behavioral changes from prolonged periods of night lighting (A)
- Loss of vegetative cover in used areas (A)
- Potential destruction of nearby breeding habitat or sites (A)
- Reduced water quality of nearby surface waters through disposal of garbage, dirty diapers, charcoal and other such items in the nearby surface water body (F, H, I)
- Campfires cause smoke that can disturb animals, and can cause wildfires. Wood collection can disturb wildlife and habitat (A)
- Crushing of plants and animals on roadways within the developed sites (B, H, I, M, R)
- Collection of species of concern as pets, food or for crafts (A)

- Shooting of species and habitats (A)
- Loss or damage to species from use of herbicides and pesticides during site maintenance (A)
- Fragmentation of occupied habitats and interference with seed dispersal, pollinating mechanisms, and movement corridors (A)
- Disturbance/death/injury to species by domestic pets accompanying forest users (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Ski Areas Effects

Activities associated with ski areas and ski area management include: clearing vegetation for installation of ski runs; maintenance of cleared slopes (annual brushing, mowing, grubbing; removal of hazard trees); erosion control activities (culverts, culvert maintenance, slope contouring, sediment basin installation/maintenance, water bar maintenance and installation); snow-blowing (including generator operation); grooming of snow-covered slopes (including operation of heavy equipment during the day and at night); snow-making (including development/maintenance of water storage ponds and water diversions); night lighting of slopes; summer use activities (concerts, horseback riding, skateboarding parks, mountain biking events); operation and maintenance of facilities on site (restaurants, ski lift towers/terminals, administrative offices, radio towers, etc.).

The following effects may be associated with ski areas. The species that are effected by ski areas and ski area activities are noted in parentheses below.

Ski areas may cause loss of individuals or habitat by:

- Temporary or long-term abandonment of habitat on/adjacent to ski areas due to high and continuous levels of noise/human disturbance (A)
- Habitat losses in areas type-converted from natural vegetation to cleared ski runs (A)
- Changes to hydrological functions/soil quality from grading, contouring, snowmaking, etc. (A)
- Alterations in the water tables at ski areas where their water is supplied by ground wells or springs (A)
- Reduction in riparian vegetation and surface water availability where water tables have been altered (A)
- Lower water quality in down slope areas due to fertilizers, etc. (A)
- Lowered water quality in down slope areas due to higher sedimentation levels from on-site erosion (A)
- Interferences with behavior due to night lighting (B, M, I)
- Noise from ski area operations interfering with normal behavioral patterns (B, T)
- Night lighting interfering with behavior (A)
- Night lighting increasing susceptibility of predation (M, B)
- Losses of riparian areas due to culverts/water control devices (A)
- Abandonment of areas due to human disturbance levels (B, M, R)
- Altered water tables and associated wetland vegetation due to water diversions (A)
- Introduction of exotic species for landscaping/erosion control (A)
- Disturbance to or loss of vegetation during maintenance (mowing, clearing, etc.) (B, I, M)
- Loss/injury due oil, gas, or chemical spills from equipment (A)
- Loss/injury/crushing by maintenance vehicle collision (H, R, M,)
- Crushing by mountain bikes (H, M, R)

- Introduction of exotic weeds from seeds carried on motorized/mechanized vehicles (A)
- Harassment and mortality by pets/domestic animals accompanying visitors to the area (B, M, R)
- Fragmentation of habitat or losses of movement corridors (M, B)
- Loss of habitat for forest interior species (A)

Trails Activity Effects

The use, maintenance and construction of non-motorized trails may include some of the following activities. Trail Use may include: (activities may occur on designated trails and/or in a dispersed manner) walking, equestrian and mountain bicycle travel, wildlife viewing, photography, picnicking, presence of domestic pets/dogs. Trail construction may include: cutting of vegetation to clear trail tread; soil movement during construction, installation of crib walls and like structures to stabilize trail, construction of trailhead parking areas including grading, installation of surface materials (gravel, asphalt or concrete), dredging and filling of wetland and/or riparian habitats for stream crossings, construction of foot bridges or other crossing structures, installation of signs, trailhead markers and registration points; access features for wildlife species such as bears and mountain lions(culverts/bridges). Trail maintenance may include: building water dips and rehabilitative activities that require soil movement, repeated pruning of vegetation along trails to provide proper clearance for use; possible use of herbicides to combat invasive plant species; maintenance of signs and trailhead markers and registration points.

The following effects may be associated with trails. The species that are affected by trails and trails use and are noted in parentheses below.

Trail related activities may cause loss of individuals or habitat by:

- Human disturbance by to animals that affect feeding, breeding and resting behaviors, particularly in riparian areas (A)
- Crushing/mortality of animals, plants and burrow systems (H, I, M,R)
- Increased runoff and resultant sediment affecting water quality (F, H, I)
- Death/injury of individuals or habitat damage by herbicides applied during maintenance (A)
- General disturbance of species due to human activity (B, F, H, I, M)
- Providing access for legal and illegal shooting and hunting purposes (A)
- Loss of vegetative cover (A)
- Compaction of soils in trail tread and loss of habitat (A)
- Erosion, increased runoff and resultant sediment affecting water quality (F, H, I)
- Introduction of exotic species by users and pack stock (A)
- Trail provides access to illegal OHV travel into sensitive habitat areas (A)
- Collection of “species of concern” as pets, food or for crafts (A)
- Shooting of species and habitats (A)
- Disturbance/death/injury to species by domestic pets accompanying forest users (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Roads/OHV Trail Effects

Activities associated with the use, maintenance and construction of roads and OHV trails include: vehicular travel; fuel and/or other toxic substance spills; hauling of materials; presence of people and domestic pets, road maintenance activities (grading of road surfaces, installation of road surfaces (gravel, asphalt, cement); clearing of snow or debris following storm events; filling of washouts and potholes, brush removal, mowing, culvert

cleaning) and motorized events for groups.

Due to the high concentration of aquatic and riparian species of concern that occur in riparian areas, the effects of roads and OHV trails at streams crossings are considered separately below.

The following effects may be associated with roads and OHV trails. The species that are affected by activities related to roads and OHV trails at stream crossings use and are noted in parentheses below.

Roads and OHV trail activities may cause loss of individuals or habitat by:

- Crushing and mortality of animals, plants and burrow systems (A)
- Creation of sediment affecting water quality (F, H, I)
- Creation of dust which coats nearby species and habitat (A)
- Pollution of water from introduction of toxic substances (F, H, I)
- Generation of noise (day and night) (A)
- Intermittent night lighting (A)
- Providing access for illegal shooting (A)
- Loss of vegetative cover (A)
- Introduction of exotic species brought in on tires/treads/undercarriage of vehicles (A)
- Use of herbicides for weed and grass control (A)
- Blockage or interruptions of migratory or other species movement corridors for feeding, breeding and dispersal (F, H, I,M)
- General disturbance of species through presence of vehicles and noise (B, F, H, I,T)
- Erosion due to concentration of water along roads
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Impacts of Road and OHV Trail at Stream Crossings

The level of intensity of impacts typically increases significantly at stream crossings for the aquatic species due to the concentrated occupancy of the species and effects at these locations.

Activities associated with the use, maintenance and construction of road and OHV trail at stream crossings include: vehicular traffic (personal, commercial and heavy construction vehicles), fuel and/or other toxic substances spills, presence of people and pets, road maintenance activities (grading of road surfaces, installation of road surfaces (gravel, asphalt, cement); clearing of snow or debris following storm events; filling of washouts and potholes), motorized events for large groups.

The following effects may be associated with roads and OHV trails at stream crossings. The species that are affected by activities related to roads and OHV trails at stream crossings use and are noted in parentheses below.

Roads and OHV trail activities at stream crossing may cause loss of individuals or habitat by:

- Human disturbance that disrupts feeding, breeding and resting behaviors (A)
- Crushing of animals, plants and burrow systems (F, H, I,T)
- Creation of sediment affecting water quality (F, H, I)
- Creation of dust/mud which coats nearby species and habitat (A)
- Pollution of water from introduction of toxic substances (F, H, I)
- Generation of noise (day and night) (A)

- Behavioral changes from periods of night lighting (A)
- Providing access for illegal shooting of individual organisms (A)
- Loss of vegetative cover (A)

Outfitter-Guide Operations

As activities authorized under special use permit, each request is evaluated for potential impacts and sensitive habitat areas are avoided as a condition of permit approval. Many of the outfitter-guides operate on existing trails or forest system roads. The types of activities involved under this category include jeep tours, llama, horse, mule, burro pack trips (day trips or overnight camping), horseback rides (part or full day), guided hunting trips, snow cat tours, cross-country skiing tours, orienteering, and guided mountain bike tours.

The following effects may be associated with outfitter-guide operations. The species that are affected by activities related to outfitter-guide operation are noted in parentheses below.

Outfitter-guide operations and associated activities may cause loss of individuals or habitat by:

- Modification of habitat by erosion, down cutting and sediment deposition due to in-stream construction (culverts, fords or other structures) (A)
- Alteration of hydrological patterns and disruption of migration (F, H)
- Disturbance/death/injury to species by domestic pets accompanying forest users (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Water Play

Water play activities occur within streams, waterfalls, rivers, lakes and reservoirs. Activities associated with water play include: swimming, wading, building small rock dams to pool water, sun bathing, boating, water skiing, jet skiing, and stream/lake-side picnicking.

The following effects may be associated with water play. The species that are affected by activities related to water play are noted in parentheses below.

Water play and associated activities may cause loss of individuals or habitat by:

- Mortality due to trampling and/or crushing of adults, juveniles, metamorphs, and eggs (H, F)
- Mortality due to sedimentation and smothering of eggs and larvae (H, F)
- Mortality due to intentional capture/fishing/poaching (H, F)
- Mortality due to increased predation by non-native species brought to the site (A)
- Reduced reproductive success due to prolonged disturbance during breeding season (H, F, B)
- Habitat abandonment due to prolonged disturbance (B, M, H, R)
- Short and long-term habitat modification by trampling (stream bank erosion from vegetation loss, streambed alteration, intensive use) and reduced cover, forage, nests (A)
- Short and long term reduction in water quality (H, F)
- Short and long-term habitat modification due to the creation of barriers to movement (rock dams) (F)
- Water pollution from manufactured oils (sunscreens and lotions) (H)
- Disturbance/death/injury to species by domestic pets accompanying forest users (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Outfitter-Guide Operations

Outfitter-Guides activities are authorized by special use permit and limitation on activities that potentially damage

or disrupt sensitive species and habitat areas included as conditions for permit approval. Many outfitter-guides operate on existing trails or forest system roads. Activities involved under this category include jeep tours; llama, horse, mule or burro pack trips (day trips or overnight camping); horseback rides (part or full day), guided hunting trips, snow cat tours, cross-country skiing tours, orienteering, and guided mountain bike tours.

The following effects may be associated with outfitter-guide operations. The species that are affected by activities related to outfitter-guide operation are noted in parentheses below.

Out-fitter-guide operations and associated activities may cause loss of individuals or habitat by:

- Human disturbance by to animals that affect feeding, breeding and resting behaviors, particularly in riparian areas (A)
- Crushing/mortality of animals, plants and burrow systems (H, I, M,R)
- General disturbance of species due to human activity (B, F, H, I, M)
- Introduction of exotic species by users and pack stock (A)
- Collection of “species of concern” as pets, food or for crafts (A)
- Shooting of species and habitats (A)
- Disturbance/death/injury to species by domestic pets accompanying forest users (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Motorcycle Trials Events

Each year, motorcycle trials events occur on the National Forests. These timed trials events require riders to ride their motorcycles over challenging rock outcrops, scoring points for skills such as balance. The events generally use an existing road for the course route, going off the road to access rock outcrops with marked routes, or course “sections”. There are generally 20-30 "sections" for testing motorcycle-riding skills.

The events run 2-3 days involving 20-60 attendees, including spectators. In addition to Forest system road and trail use, these events require a parking/staging area for camping and vehicles.

The following effects may be associated with motorcycle trials events. The species that are affected by activities related to motorcycle trials events are noted in parentheses below.

Motorcycle trials events and associated activities may cause loss of individuals or habitat by:

- Off-trail driving resulting in bare soil being exposed and cleared of any vegetation (A)
- Mud or dust is generated along roads and trails: it may interfere with vigor, health, and reproductive success of plants (I)
- Risk of trampling of animal species/dislodging of plants from being driven over or walked on by spectators and participants (A)
- Illegal, use of trails created during the event results in erosion, soil exposure and loss of vegetation (A)
- Potential impacts to adjacent habitat from erosion/runoff occurring from compacted, un-vegetated trails (H, F, P)
- Changes in hydrological patterns in adjacent habitat if trails are established (H, F, M, R)
- Reduced reproductive success due to prolonged disturbance during breeding season (H, F,B)
- Habitat abandonment due to prolonged disturbance (B, M, H, R)
- Disturbance/death/injury to species by domestic pets accompanying forest users (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Introduction of exotic species brought in on tires/treads/undercarriage of vehicles (A)

- Soil compaction on motorcycles trails and staging areas may prevent/discourage re-establishment of native vegetation (A)
- Temporary or long-term abandonment of habitat adjacent to events site due to noise/human disturbance (A)
- Death/injury from impacts with motorcycles and other vehicles (A)
- Increased sedimentation/siltation at water crossings (H, F)

Permitted Mountain Biking Race Events and Dispersed Riding

Mountain bike event races are a popular activity and may be are held each year at ski areas and on forest trails. Some of the events, such as those held at Snow Summit Ski Resort under Team Big Bear's special use permit, draw international attendance and are part of international competition to establish professional standing. Team Big Bear sponsors 8-10 race events each year, each with up to 3000 participants and 15,000 spectators. The Team Big Bear events are staged at Snow Summit Ski Resort and then use FS roads and cross-country routes for races. The following effects may be associated with mountain bike events. The species that are affected by activities related to mountain bike events are noted in parentheses below.

Mountain bike events and associated activities may cause loss of individuals or habitat by:

- Illegal, continued use of trails created during the event resulting in erosion, soil exposure and loss of vegetation (A)
- Mud or dust generated may interfere with vigor, health, and reproductive success of plants (I)
- Risk of trampling of animal species/dislodging of plants by vehicles,spectators and participants (A)
- Potential impacts to adjacent habitat from erosion/runoff occurring from compacted, de-vegetated trails (H, F, I)
- Changes in hydrological patterns in adjacent habitat where trails are established without proper design (H, F)
- Introduction of exotic non-species brought in on tires/treads/undercarriage of bikes and vehicles (A)
- Soil compaction on trails and staging areas may prevent/discourage re-establishment of native vegetation (A)
- Temporary and/or long-term abandonment of habitat adjacent to events site due to noise/human disturbance (A)
- Death/injury of individuals from impacts with bikes and other vehicles (A)
- Increased sedimentation/siltation at water crossings (H, F)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Organizational Camps (under permit on NFS lands and on private adjacent lands)

Organizational camps concentrate use and impacts in a single area. Camps are affiliated with YMCAs, scout groups, churches, colleges/university, and other large organizations. Some military "Rest and Relaxation" facilities also exist on the Forests. A typical organization camp includes a number of facilities including cabins, platform tents, administrative offices, kitchen/dining building, bathrooms, parking areas, swimming pools, ball fields, buildings for activities (crafts, nature, etc.), stables for horses, a campfire ceremony amphitheater, archery ranges, tennis courts, rifle/archery range, hiking trails, horseback trails, mountain biking trails, water play areas. Camp capacities range from 70 to approximately 300. Most operate seasonally, generally in summer. Year-round camps may accommodate conferences and meetings as well as family camping and employ a year-round on-site manager. Outdoor education programs for school groups also use organizational camps on the forests for their programs.

The following effects may be associated with organizational camps. The effects associated with trails and developed recreation site (described above) also apply here.

The species that are affected by activities related to organizational camps are noted in parentheses below.

Organizational camps and associated activities may cause loss of individuals or habitat by:

- Direct removal of vegetation during maintenance/construction activities (B, H, I, M)
- Habitat losses through invasion/introduction of non-native plant species (A)
- Losses of individuals through landscaping and mowing (B, H, I, M, R)
- Losses of habitat due to escaped campfires (A)
- Habitat losses and noise disturbance as hiking, mountain biking, and horse trails develop (A)
- Soil compaction limiting re-establishment opportunities for native vegetation (A)
- Habitat fragmentation due to structures, clearings, roads, and trails (A)
- Loss of habitat/vegetation due to construction of ball fields, corrals, campfire ceremony sites, group activity sites (A)
- Alterations in the water tables at camps where their water is supplied by ground wells or springs (A)
- Reduction in riparian vegetation and surface water availability where water tables have been altered (A)
- Mud or dust generated along roads and trails may interfere with vigor, health, and reproductive success of plants (I)
- Risk of trampling of animal species/dislodging of plants by vehicles foot traffic (A)
- Potential impacts to adjacent habitat from erosion/runoff occurring from compacted, un-vegetated areas (H, F)
- Changes in hydrological patterns adjacent habitat where clearings are established without proper design (H, F)
- Soil compaction on trails and staging areas may prevent/discourage re-establishment of native vegetation (A)
- Temporary or long-term abandonment of habitat on/adjacent to camps due to high and continuous levels of noise/human disturbance (A)
- Death/injury from impacts with bikes and other vehicles (A)
- Increased sedimentation/siltation at trail/road and water crossings (H, F)
- Losses of individuals collected for “nature program” studies (A)
- Harassment by pets/domestic animals accompanying residents/visitors of the camps (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Night lighting interfering with behavior (A)
- Introduction of exotic species for landscaping/erosion control (A)
- Harassment and mortality by pets/domestic animals accompanying visitors to the area (B, M, R)
- Fragmentation of habitat or losses of movement corridors (M, B)

Designated Cross-Country Skiing and Snow play Sites

Designated cross-country ski areas typically consist of blazed trails and roads. The snow is usually groomed with a snow cat grooming machine or equipment dragged behind a snowmobile. Some trimming of vegetation along trails may occur. Activities at the designated snow play sites under permit include: compaction of snow using mechanized equipment; some slope grading/maintenance. Each site has a cleared parking area and maintenance/permittees building facilities.

The types of effects that may be associated with snow-play areas and cross-country ski sites are the same, to a smaller scale, as those listed above for ski areas.

Large Group Gathering

A variety of large group gatherings are staged on NFS lands, including Mountain Men Rendez-Vous, Black Powder Gun Club Shooting Contests, historical re-enactments, Sheriff's Rendez-Vous and weddings.

These gatherings are usually one-time events with up to several hundred people. Activities vary depending on the type of gathering. They typically involve staging/camping for up to several hundred people and include parking and campfire permits are for several large communal campfires. The groups are required to provide porta-potties for sewage disposal.

Some groups have organized contests/activities such as target shooting (rifle, muskets, archery, etc.). The participants camp at designated or dispersed random sites depending on the type of exercise. As these events are under special use permit, each event is evaluated for potential impacts, and sensitive habitat areas are avoided as a condition of permit approval. For larger events, unusual situations, or special uses permit activity that involves ground-disturbing activities, botanical and wildlife surveys are completed.

The following effects may be associated with permitted Large Group Gatherings. The species that are affected by activities related to Large Group Gatherings are noted in parentheses below.

Large group gathering activities may cause loss of individuals or habitat by:

- Introduction of exotic weeds from seeds carried on motorized/mechanized vehicles (A)
- Losses of habitat due to escaped campfires (A)
- Mud or dust is generated along roads and trails: it may interfere with vigor, health, and reproductive success of plants (I)
- Risk of trampling of animal species/dislodging of plants from being driven over or walked on (A)
- Potential impacts to adjacent habitat from erosion/runoff occurring from compacted, de-vegetated areas (H, F)
- Soil compaction on trails and staging areas may prevent/discourage re-establishment of native vegetation (A)
- Temporary or long-term abandonment of habitat on/adjacent gathering sites due to high levels of noise/human disturbance (A)
- Death/injury from impacts with mechanized and motorized vehicles (A)
- Harassment/mortality by pets/domestic animals accompanying gathering participants (A)
- Short-term disturbance from helicopter wash and noise (B, T)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Marinas, Boat Launches

Marinas under permit on National Forest System lands typically consist of parking areas, a boat ramp into the water, and bathroom facilities. Maintenance activities include periodic reinforcement of boat ramps and/or shoreline erosion control riprap/jetties. Some of the sites have landscaping. Parking lots are periodically resurfaced. Some of the facilities are seasonal (higher elevation sites operate May to December), while others are year-round. Some of the facilities include fishing piers and picnicking areas.

The following effects may be associated with Marinas, Boat Launches. The species that are affected by activities related to Marinas, Boat Launches are noted in parentheses below.

Marinas and boat launch activities may cause loss of individuals or habitat by:

- Introduction of exotic weeds from seeds carried on motorized/mechanized vehicles (A)

- Habitat losses through invasion/introduction of non-native plant species. These species are generally non-native and may be invasive, out-competing native plants and altering natural vegetation communities. (A)
- Loss of habitat due to clearings for parking and facilities (A)
- Risk of trampling of animal species/dislodging of plants from being driven over or walked on (A)
- Potential impacts to adjacent habitat from erosion/runoff occurring from compacted, de-vegetated areas (H, F)
- Soil compaction in/around developed site may prevent/discourage re-establishment of native vegetation (A)
- Temporary or long-term abandonment of habitat on/adjacent developed site due to high and continuous levels of noise/human disturbance (A)
- Death/injury from impacts with mechanized and motorized vehicles (A)
- Losses of individuals collected by visitors (A)
- Harassment/mortality by pets/domestic animals accompanying visitors (A)
- Lowered water quality in adjacent water areas due to higher sedimentation levels from on-site erosion (H, F)
- Introduction of exotic species for landscaping/erosion control (A)
- Disturbance to or loss of vegetation during maintenance (mowing, clearing, etc.) (A)
- Loss/injury due to oil, gas, or chemical spills from equipment (A)
- Loss/injury/crushing by maintenance vehicles (A)
- Fragmentation of habitat or losses of movement corridors (A)
- Changes to hydrological functions/soil quality from grading, contouring, etc. (A)
- Shoreline erosion (and loss of adjacent vegetation/habitat) from wave action generated by boats and associated lake bottom dredging (A)
- Lowered water quality around boat ramp from boat fuel and oil (F, H)
- Disturbance from high levels of noise from boat motors (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)

Target Shooting Ranges

Shooting ranges on National Forest System lands may be operated under special use permit or may be designated areas open for target shooting. Special use permit areas typically have cleared areas (some are old borrow pits) that are flat with a sloping backdrop. Some have shaded facilities from where shooting is done. Others have small “improvements” like concrete supports for targets. Each shooting range has an access road and cleared parking area. Some shooting ranges are operated as clubs with access to club members and the general public. Operating seasons vary from year-round to summers only. Some of the shooting ranges are open only on weekends while others are open 7 days/week. Activities include general maintenance of facilities and parking area, vegetation clearing for fire hazard reduction, cleanup of target and ammunition materials, shooting of various caliber weapons, and gatherings for shooting competitions.

Target shooting results in a "zone of influence" in which, compared to similar areas where shooting does not occur, there are: 1) fewer individual animals; 2) a decreased diversity of species; 3) a lower density of animals; 4) decreased nesting and denning activity; and, 5) lower biomass.

There is evidence that lead contamination of ground and surface water is rarely a problem in outdoor shooting ranges since the chemical process by which lead enters the ground water is not operable where the lead fragments are exposed to air. These fragments form an oxidized outer layer, which prevents leaching of lead into the ground water. Except in cases where the lead is present in finely powdered form, under extremely alkaline soil

conditions, lead will not leach into the ground water (P.Brierty, San Bernardino County Environmental Health Department in a December 1988 telecom with G. Earney, US Forest Service and EPA testing at Lytle Creek shooting area).

The following effects may be associated with Target shooting ranges. The species that are affected by activities related to target shooting ranges are noted in parentheses below.

Target shooting range activities may cause loss of individuals or habitat by:

- Loss of soil due to a lack of vegetative cover (A)
- Accumulation of lead, copper and other materials in the soil (A)
- Injury or death to a low number of animals, mostly birds and small terrestrial species, that stray into the site when it is in operation (B, M)
- Temporary or long-term abandonment of habitat on/adjacent gathering sites due to high levels of noise/human disturbance (A)
- Habitat losses through invasion/introduction of non-native plant species that out-compete native plants and alter natural vegetation communities (A)
- Loss of habitat due to clearings for parking, target range, and facilities (A)
- Risk of trampling of animal species/dislodging of plants from being driven over or walked on (A)
- Potential impacts to adjacent habitat from erosion/runoff occurring from compacted, de-vegetated areas (H, F)
- Soil compaction in/around developed site may prevent/discourage re-establishment of native vegetation (A)
- Temporary or long-term abandonment of habitat on/adjacent developed site due to high and continuous levels of noise/human disturbance (A)
- Death/injury from impacts with mechanized and motorized vehicles (A)
- Harassment/mortality by pets/domestic animals accompanying visitors (A)
- Lowered water quality in adjacent water areas due to higher sedimentation levels from on-site erosion (H, F)
- Introduction of exotic species for landscaping/erosion control (A)
- Introduction of exotic weeds from seeds carried on motorized/mechanized vehicles (A)
- Disturbance to or loss of vegetation during maintenance (mowing, vegetation trimming, clearing, etc.) (A)
- Increased risk of habitat loss due to escaped fires triggered by shooting (A)
- Loss/injury due to oil, gas, or chemical spills from equipment (A)
- Loss/injury/crushing by maintenance vehicles (A)
- Loss/injury from ingestion of/entanglement with target/ammunition materials or trash. (A)
- Fragmentation of habitat or losses of movement corridors (A)
- Changes to hydrological functions/soil quality from grading, contouring, etc. (A)
- Lead dust causing soil toxicity (A)
- Lead shot poisoning with animal consumption (B)

Non-recreation Special Uses - Effects

Activities associated with non-recreation special uses include : (Non-hydropower) surface water extraction, spring developments, water conveyance structures (pipelines, tunnels, ditch lines, and flumes) including construction,

installation and maintenance; ground water extraction: (domestic use, wells, pump-houses, water conveyance structures and the associated water losses), transportation (corridors for railroads, access roads, highway and freeway construction, reconstruction and road management), collection of non-locatable minerals - sand, gravel and rocks (large and small removal operations), power lines and utility corridors (towers, lines, clearings, oil and gas pipe lines, cable lines, water lines, power lines, sewer lines; communication tower structures); others - e.g. sediment placement sites, apiaries, ground based weather modification devices, gauging stations; filming permits, tribal collection of native plant materials, introductions of non-native species-plants, fish, or wildlife, and flood control activities (channelization; berm maintenance; storm damage repair.

The following general effects may be associated with the Special uses activities. The species that are affected by these activities are noted in parentheses below.

General Effects/Special Uses

Special use activities may cause loss of individuals or habitat by:

- Loss or degradation of habitat from construction and maintenance activities (A)
- Sedimentation potential to aquatic areas when sites are located adjacent to water courses and riparian areas (F, H)
- Interference with species behavior from noise (B, M, H)
- Increased risk of Hazmat spills into imperiled species habitat from equipment and/or site (A)
- Direct removal of species (A)
- Trampling and crushing during large group gatherings and equipment staging (A)
- Temporary habitat abandonment due to noise disturbance (B,M)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Introduction of exotic weeds from seeds carried on motorized/mechanized vehicles (A)

In addition to the general effects, some Special use activities may have specific impacts:

Surface water extraction

- Loss of habitat from change in water quantity (dewatering; reduction in instream flows - change in flow timing, magnitude, and duration) (F, H, M, B)
- Lowered water quality (water temperature changes, sedimentation, chemical spills from facilities or support vehicles) (F, H, M)
- Decrease or loss of riparian vegetation (A)
- Fragmentation of habitat or losses of movement corridors, genetic isolation (A)

Ground water extraction

- Lowered surface and groundwater quantity at, adjacent, and downstream to the extraction point (A)
- Lowered surface and groundwater quality at, adjacent, and downstream to the extraction point (A)
- Decrease or loss of nearby riparian vegetation from lowered water table (A)
- Interference with/loss of connectivity between habitats/genetic isolation (A)
- Interference with/loss of connectivity between upstream and downstream habitat because of location of ditch lines and other conduits/genetic isolation (F, H, M)
- Indirect/un-intended net loss of ground water through tunnel leaks associated with drilling of tunnels (tunnels associated with transport of California Water Project water)(A)
- Decline or loss of nearby riparian vegetation from construction activities (A)

Communication towers

- Loss or degradation of habitat from construction, reconstruction and maintenance of site (A)
- Erosion and associated down slope sedimentation (F, H,)
- Death or injury from collisions (B)

Power lines and utility corridors

- Loss of habitat due to construction, reconstruction and maintenance of poles (A)
- Interference with/loss of connectivity (fragmentation) between habitats from power line and utility corridors (H, M,)
- Loss of foraging, nesting and cover habitat from herbicide applications and/or vegetation clearing in corridors (A)
- Death or injury from collisions and electrocutions (B)
- Increased risk of wildfires and loss of habitat and individuals (A)
- Loss/injury due oil, gas, or chemical spills (including pesticides) (A)
- Habitat loss associated with access roads (A)

Non-locatable mineral removal

- Direct death or injury from removal or burying of species (A)
- Loss/destruction of habitat (removal or burying) (A)
- Increased risk of hazardous materials spills into habitat from mechanized equipment (A)
- Degradation of water quality from equipment in and around water, destruction of riparian and non-riparian vegetation while removing rocks and minerals (A)
- Fragmentation of habitat due to excavation and dumping (A)
- Alteration of surface hydrology (F, H)
- Reduced slope stability and accelerated soil loss (H, P, F)
- Crushing and trampling of imperiled species from equipment and permittees (A)
- Introduction of exotic weeds from seeds carried on motorized/mechanized vehicles (A)
- Increased sedimentation at site and downstream causing egg and larvae suffocation, and decreased oxygen, increased water temperatures and filling of pools (F, H)

Introductions of non-native species-plants, fish, or wildlife

- Competition with/predation on native species (A)
- Hybridization/loss of genetic purity with imperiled native species (F)
- Introduction of disease from other regions (A)
- Destruction of vegetation by introduced biocontrol species (I)

Grazing

Activities associated with livestock grazing includes livestock feeding/living in habitat, transport of livestock by vehicle/trailer, construction and maintenance water systems and feeding/salt sites, installation and maintenance of fences and cattle guards, construction, use and maintenance of corrals and loading chutes, development of trails and stream crossings for livestock movement, use of horses in management of the allotment, construction and maintenance of earthen ponds, use of hay and other supplemental foods, and the use of fertilizers and

supplemental watering for pastures. Existing Land and Resource Management Plans would allow grazing on approximately 1,055,000 acres on the Cleveland, Los Padres and San Bernardino National Forests. Grazing of sheep on fuelbreaks is allowed on the Angeles National Forest. Current levels of use are approximately 701,241 acres. The additional 353,759 acres are either in non-use or vacant allotments.

The following effects may be associated with Grazing. The species that are affected by activities related to grazing are noted in parentheses below.

Grazing activities may cause loss of individuals or habitat by:

Negative effects

- Direct trampling of listed plants or animals (A)
- Trampling of stream banks and stream bed habitat including burrow systems (H, F, P, M, I)
- Denuding of vegetation from areas of concentrated use (A)
- Creation of potential aquatic breeding habitat for listed and un-desirable non-native species (H, F)
- Spread of un-desirable non-native seeds, spores and larval life stages (I,)
- Smothering of egg masses and larval life stages from added sedimentation (H, F, I)
- Coating of algae and other aquatic plants from increased sedimentation (H, F, I,)
- Direct removal of plants due to grazing or browsing activities (A)
- Introduction of un-desirable non-native species from hooves, hides or manure or by soil disturbance (A)
- Competition with other native herbivores for forage species (M)
- Removal of hiding and nesting cover for wildlife species (B, H, I, M)
- Increases in nutrients to system from fertilizers and manure
- Water temperature increase and stream widening from loss of vegetative stream or over story vegetation (F, H, I,)
- Reduction in oxygen content of water due to eutrophication from deposition of feces (F, H, I)
- Soil compaction (M, I)
- Water competition with native species (A)
- Hydrological changes from trails and vegetation removal (A)
- Litter (nuisance species/ingestion of plastic/animal entrapment) (A)
- Introduction of exotic weeds from seeds carried on motorized/mechanized vehicles (A)

Positive Effects

- Increased water temperatures and growth of algal mats which may enhance growth and development of larval stages of some aquatic animal species (F, H, I)
- Prevention or reduction woody species encroachment into open habitat (B, I, M)

Mining Activity Effects

Mining activities on NFS lands varies widely, from small-scale recreational prospecting, to massive commercial pit mining, to oil and gas wells. Activities associated with mining include: claims assessment work, exploration, initial removal of habitat in advance of mining; excavation of quarries (drilling, blasting, and digging), production of waste piles and overburden, roads (construction, expansion, realignment, use, and maintenance), well development and maintenance, reclamation activities (re-contouring slopes, erosion control, revegetation) storage and processing facility development, use, and maintenance. If a claim is patented, the land becomes

private and is no longer under NFS management and jurisdiction.

The following effects may be associated with Mining activities. The species that are affected by activities related to mining are noted in parentheses below.

Mining activities may cause loss of individuals or habitat by:

- Direct removal/destruction of organisms (A)
- Direct removal/destruction of habitat (A)
- Burying organisms under waste material (H, M, F, I)
- Burying habitat under waste material (A)
- Destruction or degradation of habitat via spills/leakage of oil and other hazardous materials (A)
- Fragmentation of habitat by mining roads, pits, etc. (A)
- Alteration of surface hydrology and topography (A)
- Alteration of subsurface/groundwater hydrology (A)
- Reduced slope stability and accelerated soil loss (H, F)
- Chronic deposition of dust on habitat (I)
- Crushing and trampling of organisms and habitat via off-road vehicular and foot travel (H, P)
- Transfer of lands supporting organisms and habitat from NFS, into private ownership (A)
- Loss and reintroduction of plants via reclamation and revegetation efforts (P)
- Introduction and spread of invasive exotic species (A)
- Increased unauthorized public vehicular use of habitat accessed by mining roads, including recreational OHV use, un-permitted wood-cutting, etc. (A)
- Accelerated fire cycle via invasive species, mining-related starts, and un-permitted wood-cutting starts, etc. (A)

Timber/Fuel wood/Forest Products Harvesting Effects

Commercial timber harvesting is conducted on a small scale on southern California National Forests. Most often, commercial sales are associated with salvage operations, removing trees killed by fire, disease, or drought. For use as firewood, downed trees are usually limbed, cut to length, and loaded directly into trucks. Saw logs are skidded by dozer or tractor to the landing where they are loaded onto trucks. Temporary roads may be constructed to access the logging areas.

In addition to providing wood for commercial fuel wood sales, the Forests have a personal use fuel wood program. The general public may purchase permits for cutting a small amount of wood from downed logs or marked standing dead trees. Cutting/removing wood is permitted seasonally when soils are relatively dry and activities are less likely to cause resource damage.

While the impact of accessing fuel wood is generally confined to about a 100' distance from roads, the impact area may vary with topography and vegetative cover: open flat areas provide easier access to fuel wood and suffer higher levels of impacts. However, illegal roads/trails are established when as people drive cross-country to access fuel wood.

The Forests also allow some level of harvesting of various special forest products such as branches of various shrubs, cone collections, deer grass, pinecones, mistletoe, and the harvesting of bracken ferns fiddleheads. Permits are also occasionally issued for seed collecting to commercial native-plant propagators. Permittees are allowed to collect common species. Permit provisions and collection location guidelines limit collecting in vulnerable habitats in addition to prohibiting collection of rare species.

The following effects may be associated with timber harvesting, fuel wood gathering, and forest products

gathering. The species that are effected by activities related timber harvesting, fuel wood gathering, and forest products gathering are noted in parentheses below.

Timber harvesting, fuel wood gathering, and forest products gathering activities may cause loss of individuals or habitat by:

- Crushing and trampling of organisms and habitat via off-road vehicular and foot travel (A)
- Fire caused by woodcutting activities (A)
- Litter (attracts nuisance species/ingestion of plastic/animal entrapment) (A)
- Introduction of exotic weeds from seeds carried on motorized/mechanized vehicles (A)
- Loss of habitat due to clearings for parking and equipment storage (A)
- Mud or dust is generated in project area: it may interfere with vigor, health, and reproductive success of plants (I)
- Potential impacts to adjacent habitat from erosion/runoff occurring from compacted, devegetated areas (H, F, I)
- Soil compaction in/around project site may prevent/discourage re-establishment of native vegetation (A)
- Temporary or long-term abandonment of habitat on/adjacent developed site due to high and continuous levels of noise/human disturbance (A)
- Losses of individuals collected by visitors (A)
- Harassment/mortality by pets/domestic animals accompanying permittees (A)
- Lowered water quality in adjacent water areas due to higher sedimentation levels from on-site erosion (H, F)
- Loss/injury due to oil, gas, or chemical spills from equipment (A)
- Fragmentation of habitat or losses of movement corridors (A)
- Disturbance to nest sites and cover during harvesting of forest products (branches, stems, grass, seeds) (B)
- Loss of host plants or larvae disturbance during forest products harvesting (I)
- Impacts to water quality where forest products are gathered in riparian habitat (A)

Appendix C. Invasive Species

The spread of invasive weeds on the national forests of southern California is threatening the health of forest, chaparral, and grassland ecosystems. Current inventories indicate that weeds are spreading at an increasing rate within the southern California national forests, especially along roads, trails, and stream corridors. The spread of noxious weeds and nonnative invasive plant species reduces biological diversity; impacts threatened and endangered species, wildlife habitat, modifies vegetative structure and species composition; changes fire and nutrient cycles; and degrades soil structure.

Under the National Forest Management Act (NFMA), and the Forest and Range Renewable Resource Planning Act (RPA), the national forests were given the task of preparing land management plans to establish management direction along with long-range goals and objectives. During the development of land management plans in southern California in the late 1980s, the problems caused by noxious weeds were not as widely recognized as they are today. Initial efforts in education, prevention, inventory, control, and monitoring were piecemeal and uncoordinated. The national forests in southern California are now revising their land management plans, and this strategy, as an appendix, provides a bridge between land management plan direction of the past and our vision of future conditions in the southern California national forests.

In 1995, the Forest Service revised its national policy on noxious weed management (FS Manual 2080). The new policy places stronger emphasis on integrated weed management. It outlines responsibilities for integrated pest management, prevention and control measures, cooperation, and information collection and reporting.

In 1998, the Forest Service developed, in conjunction with other federal agencies, a strategy for the management of noxious weeds. That strategy, entitled *Pulling Together: A National Strategy for Invasive Plant Management*,focused on three primary goals: effective prevention, control, and restoration. The Forest Service also developed a national strategy focusing on five areas: prevention and education; control; inventory, mapping, and monitoring; research; and administration and planning.

In response to national direction and regional needs, the Pacific Southwest Region has subsequently developed a *Noxious Weed Management Strategy and Action Plan*. Tiered to the national strategy, the Regional strategy has three primary goals:

- Increase the understanding and awareness of noxious weeds and the adverse effects they have on wildland ecosystems.
- Develop and promote implementation of a consistent integrated pest management (IPM) approach. Institutionalize consideration of noxious weeds in all planning and project analyses.
- Develop strong partnerships and cooperation with private landowners, county governments, state and federal agencies, extension service, universities, and the research community for a consolidated and united approach to managing invasive species.

The Region's strategy uses six emphasis areas to address these goals: coordination and cooperation; prevention and education; control; inventory, mapping, and monitoring; research; and administration and planning. Within each emphasis area, the strategy identifies objectives and proposed action items to carry the regional noxious weed program forward.

In a similar fashion, this southern California national forests' noxious weed strategy is tiered to the regional strategy. The purpose of the southern California strategy is to transform these region-wide goals and emphasis areas into a 3-5 year action plan that results in on-the-ground accomplishments.

Coordination and Cooperation

The spread of invasive weeds ignores all boundaries. The only way that the national forests in southern California can succeed in the control and prevention of noxious weeds is through coordination and cooperation with neighbors and partners. The southern California national forests have been active in the Big Sur Weed Management Area and the San Diego County Weed Management Area, and it is now becoming a more active

participant in the Kern County Weed Management Area, the Santa Barbara County Weed Management Area, and the San Luis Obispo County Weed Management Area.

Objectives:

- Use Weed Management Areas to consolidate and coordinate weed control across jurisdictional boundaries.
- Ensure that adequate scientific expertise, organization skill, and administrative support is available for local weed management efforts.
- Minimize barriers to noxious weed prevention and control efforts.

Proposed Actions:

- Encourage all forests/districts to be active participants and leaders in Weed Management Areas.
- Coordinate with CalTrans to:
  - Control French broom at the Hwy 1 Maintenance Yard and along West Camino Cielo.
  - Control Spanish Broom along Highways 74, 67, and Interstate 8.
  - Inventory and monitor weeds along Hwy 1.
- Coordinate with San Diego Water Utilities Department to control tamarisk in Santa Ysabel and Cottonwood Creeks.
- Coordinate with State Coastal Conservancy to control tamarisk in San Mateo Creek.
- Coordinate with Sespe Flyfishers and Keep the Sespe Wild volunteers to control tamarisk in Sespe Creek.
- Coordinate with Tree People volunteers to control tamarisk in Piru Creek.
- Coordinate with Kern County Weed Management Area to eradicate Dalmatian toadflax on 250 acres near Frazier Park.
- Coordinate with Kern County Weed Management Area and Pine Mountain Club to eradicate spotted knapweed.
- Coordinate with California Department of Agriculture and San Diego County to control spotted knapweed in the Julian area and on Palomar Mountain.
- Coordinate with Big Sur Weed Management Area and California State Parks to control 5 acres of French broom along the Vicente Flat Trail.
- Coordinate with Big Sur Weed Management Area and National Fish and Wildlife Foundation to control 2 acres of Cape ivy and 80 acres of Italian thistle.
- Coordinate with Monterey County Agricultural Commissioner to eradicate 5 acres of pampas grass at Kirk Creek Campground.
- Continue to allow San Luis Obispo County to test yellow star-thistle control techniques at Pozo Corrals.
- Coordinate with Orange County to control arundo, fig, and castor bean on the west side of Trabuco Ranger District.
- Work with Chumash and Salinian Native Americans to identify and control noxious weeds in areas of concern to tribal members.
- Work with other program areas to gain support and investment in the prevention, education, and control of noxious weeds.
- Coordinate with partners to:
  - Implement prevention programs to prevent spread of weeds along trails and roads.

- Develop education programs for forest visitors.
- Control arundo.
- Release biological control agents for yellow star-thistle and spotted knapweed.

Prevention and Education

Prevention can help slow or prevent the introduction and establishment of noxious weeds in the southern California national forests. Education is an integral part of prevention. Having an informed workforce as well as cooperators and the public is an important part of managing invasive species.

Currently, Forest Service staff, permittees, and the public have a limited understanding of the potential impacts that noxious weeds have on forest ecology. Even fewer understand what can be done to reduce the risk. Prevention is one of the most cost effective methods to control the spread of noxious weeds.

Objectives:

- Forest Service employees are well informed on noxious weed issues.
- Prevention measures such as weed-free forage, straw, and fill requirements are in use.
- Weed prevention practices and mitigation measures are incorporated into all Forest Service activities.
- Noxious weed prevention clauses are incorporated into Forest Service contracts, and permits.
- Educational materials to increase public awareness of noxious weed issues are used in conjunction with other agencies and other resource areas with in the Forest Service.

Guidelines/Design Criteria:

- Use regionally approved standard clauses for equipment cleaning for timber, fire, engineering, recreation, watershed improvement and other contracts.
    - Educate personnel on need for standard clauses
    - Require their use where needed
- Implement Regional Special Order requiring the use of weed-free forage and straw.
- Use weed-free materials in facilities maintenance and construction: gravel, fill, straw, and seed mixes.
- Encourage the adoption of noxious weed prevention practices by other agencies.
- Develop forest training courses for noxious weed prevention. Target employees who have field going and public contact responsibilities, line officers, and key staff.
- Develop a public education program including interpretive signs in campgrounds and trailheads, brochures with maps and permits, school visits, and similar methods.
- Develop a communication strategy for invasive weeds that coordinates activities with other agencies, organizations and volunteers.

Control/Project Planning

Some districts have instituted successful noxious weed control projects, while other units have not yet done so. Given the number of acres infested and projections for new infestations, it is clear that present funding levels are insufficient to deal with noxious weed problems. This funding level has limited the southern California national forests' capability to build an effective noxious weed control program.

The national forests have Noxious Weed Management Coordinators and a Forest Pesticide-Use Coordinator. These duties are collateral along with other responsibilities. Currently, the southern California national forests annually treat about 22 miles of stream and 252 acres of uplands to control noxious weeds. The primary target species in these efforts are tamarisk, Dalmatian toadflax, artichoke thistle, Italian thistle, Spanish broom, French broom, pampas grass, Cape ivy, yellow star-thistle, and purple star-thistle. This work is accomplished through the

use of contractors, fire crews, volunteers, and Forest Service resources staff. On some units, the use of noxious weed risk assessments is increasing the amount of land being surveyed. Project planners and decision makers increasingly have information on the risk of spreading weeds and opportunities to incorporate weed control plans into project designs and decisions.

Objectives

- Identify and eradicate new infestations and new species on National Forest System lands.
- Complete site-specific environmental analyses for the treatment of noxious weed infestations.
- Use an integrated weed management approach to noxious weed control. Integrated weed management is an interdisciplinary pest management approach for selecting methods for preventing, containing, and controlling noxious weeds in coordination with other resource management activities to achieve optimum management goals and objectives. Methods include education; preventive measures; herbicide, cultural, physical or mechanical control methods; biological control agents; and general land management practices, such as manipulation of livestock or wildlife grazing strategies, that accomplish vegetation management objectives (FSM 2080.5).
- Have at least one individual trained on each national forest in wildland weed ecology and pesticide application.
- Noxious weed risk assessments become an integral part of project planning.

Guidelines/Design Criteria:

- Encourage personnel to obtain and maintain state pesticide use certification, whether or not restricted-use chemicals will be used.
- Prepare noxious weed risk assessments for all ground disturbing projects.
- Provide outline and examples for project-level risk assessments for use by district personnel.
- Obtain training on noxious weed ecology and management.
- Annually treat 42 miles of riparian habitat (Cuyama River watershed - 5 miles; Piru Creek - 10 miles; Santa Ynez River watershed - 5 miles; Sespe Creek - 5 miles; and Sisquoc River - 12 miles; CNF - 5 miles) for noxious weeds such as tamarisk and arundo.
- Annually treat 260 acres of uplands for noxious weeds such as pampas grass, yellow star-thistle, artichoke thistle, Cape ivy, Spanish broom, and French broom.
- Use native plant materials as needed to restore disturbed sites to prevent the introduction or reintroduction of noxious weeds.

Administration and Planning

To attain an effective noxious weed management program, there needs to be consistent direction across all the national forests within the southern California national forests. Revised land management plan direction and this appendix provide this integration as well as a priority list of objectives.

Consideration of noxious weed issues is limited or lacking in many project plans and analyses. The omission comes from a combination of factors. One factor is the limited funds available for noxious weed management in the region. Limited funds, resources and staffing result in low visibility and priority for the noxious weed program.

The national funding criteria favor regions that treat large infestations of noxious weeds. Many forests within the region are relatively free of noxious weeds, but have large infestations adjacent to their boundaries. As a result, the region doesn't compete well for limited funds. The southern California national forests must examine ways to become more competitive for national, regional, and local funds, and find ways to manage our existing funds more efficiently.

Objectives:

- Implement 3-5 year noxious weed action plans.
- Increase efforts to compete for appropriated noxious weed funding.
- Improve visibility in the management of noxious weeds; become more competitive for "cost share" funds; and increase interaction and participation with local partners to help with funding opportunities.
- Market the program to receive additional funds based on the factors that make southern California unique.

Proposed Actions:

- Annually review potential for new invasive species and the potential for existing invaders to move into new areas; plan prevention measures accordingly.
- Annually update noxious weed action plan.

Inventory, Mapping and Monitoring

Early detection and containment of noxious weeds is the most efficient method for controlling their spread. Key to early detection is the development and maintenance of an effective inventory and mapping system. The southern California national forests noxious weed inventory is recorded in part in GIS (Geographic Information Systems) and in part on hard copy maps. Portions of the southern California national forests, especially stream corridors with known or suspected populations of threatened and endangered species, have been thoroughly inventoried. Other areas, such as upland communities in wilderness areas, have been poorly inventoried for noxious weeds. A complete and interactive inventory with GIS capabilities is critical for the southern California national forests to effectively compete for national and regional funding opportunities, report and track existing infestations, and treat known populations of noxious weeds. It is equally important to share information with our neighbors and partners.

Monitoring is essential to provide information necessary for long term planning and decision-making. A monitoring program is needed to evaluate changes in invasive plant populations and whether management activities, noxious weed control projects, and prevention programs are achieving their desired goals.

There are no consistent monitoring protocols in use to assist planners and project managers in measuring short term or long term effects. As a result, integrated weed management projects may or may not meet the desired goals and objectives outlined in the project plan.

Objectives:

- Determine the distribution of noxious weed species through systematic inventories.
- Re-inventory at set intervals to determine the rate of spread and detect new weed infestations.
- Use automated databases for the storage and retrieval of information on noxious weeds. Ensure that national forests in southern California implement Forest Service inventory and monitoring protocols and that data are stored in the Terra module of NRIS.
- Ensure that monitoring standards across southern California national forests address short and long term monitoring needs.

Proposed Actions:

- Test survey and monitoring protocols developed by the Forest Service Washington office and the regional office.
- Conduct inventories of project areas for noxious weeds as part of the NEPA process.
- Continue to survey for noxious weeds as part of survey and monitoring protocols for threatened and endangered plants and animals.
- Identify streams, roads, and trails needing inventory, and provide notice for volunteers to complete needed inventories.
- Obtain training in the use of the NRIS-TERRA database system.

- Increase southern California national forest participation in the CalWeed Database.

Research

Research efforts are continually needed to examine new integrated weed management strategies for the control of noxious weeds. The region presently cooperates with California universities by providing research sites for studies.

The region needs to continue to encourage research on the ecology of noxious weed species, with an emphasis on practical application to management.

Objectives:

- The southern California national forests facilitate continued research opportunities on National Forest System lands.
- Engage the Pacific Southwest Research Station in noxious weed research projects.

Proposed Actions:

- Use the Region's website to access research results.
- Facilitate research on noxious weeds in southern California, especially in regard to management of weeds in areas managed as fuelbreaks, primary buffers, and secondary buffers.
- Support local efforts as needed to promote interagency research.

Appendix D. Inventoried Roadless Areas (IRAs)

Introduction and Evaluation Process Summary

Roadless areas refer to substantially natural landscapes without constructed and maintained roads. Some improvements and past activities are acceptable within roadless areas. Inventoried roadless areas are identified in a set of maps contained in the Forest Service Roadless Area Conservation Final Environmental Impact Statement (FEIS), Volume 2, November 2000. These areas may contain important environmental values that warrant protection and are, as a general rule, managed to preserve their roadless characteristics. In the past, roadless areas were evaluated as potential additions to the National Wilderness Preservation System. Roadless areas have maintained their ecological and social values, and are important both locally and nationally. Recognition of the values of roadless areas is increasing as our population continues to grow and demand for outdoor recreation and other uses of the Forests rises. These unroaded and undeveloped areas provide the Forests with opportunities for potential wilderness, as well as non-motorized recreation, commodities and amenities.

The original Forest Plans evaluated Roadless Area Review and Evaluation (RARE II) data from the mid-1980s and recommended wilderness designation for some areas. Most areas were left in a roadless, non-motorized use status. This revision of Forest Plans analyzes a new and more complete land inventory of inventoried roadless areas as well as other areas identified by the public during scoping. These inventoried roadless areas are evaluated by alternative to determine which areas would be recommended to Congress for wilderness designation and which areas would be allocated to an alternative land use. There were 118 roadless areas inventoried within the southern California National Forests for the Forest Plan revisions, totaling approximately 1,065,925 acres, approximately 32% of the total National Forest System lands or 47% of the total non-wilderness National Forest System lands here.

Wilderness evaluation of the roadless inventory of the Forests, as well as of other undeveloped areas proposed by the public, is based on criteria of capability, availability, and need:

- **Capability:** The capability of potential wilderness is the degree to which it contains the basic characteristics that qualify it for wilderness designation. Factors examined include environment and special features, challenge, outdoor recreation opportunities, and manageability.
- **Availability:** An area's availabilityis determined by comparing wilderness values in that location to the value of and need for other resource uses and production from the same land area.
- **Need:** The need for designation of new wilderness is based on comparing the value of a potential area to existing wilderness in nearby locations as well as to the National Wilderness Preservation System as a whole. This analysis considers demand for additional wilderness recreation opportunities on the forest. It also looks at the need to give certain vegetation types the protection that wilderness designation would afford.

Using the above criteria, each area was rated high, moderate, or low. The analysis resulted in identification of 23 roadless and other undeveloped areas within the Angeles National Forest, 21 roadless and other undeveloped areas within the Cleveland National Forest, 51 roadless areas within the Los Padres National Forest, and 23 roadless areas within the San Bernardino National Forest. The following tables list the names, acreage and ratings of all the areas evaluated:

- Table 343: Angeles National Forest - Inventoried Roadless Areas evaluated
- Table 344: Angeles National Forest - Publicly proposed other undeveloped areas evaluated
- Table 345: Cleveland National Forest - Inventoried Roadless Areas evaluated
- Table 346: Cleveland National Forest - Publicly proposed other undeveloped areas evaluated

- Table 347: Los Padres National Forest - Inventoried Roadless Areas evaluated
- Table 348: Los Padres National Forest - Publicly proposed other undeveloped areas evaluated
- Table 349: San Bernardino National Forest - Inventoried Roadless Areas evaluated
- Table 350: San Bernardino National Forest - Publicly proposed undeveloped areas evaluated

See "Wilderness Evaluations" on the southern California Forest Plan Revisions website, http://www.fs.fed.us/r5/scfpr, for a full description and analysis of all areas.

Proposed Wilderness by Alternative

Roadless areas possess important social and ecological values as well as characteristics that are becoming scarce in the rapidly urbanizing landscape of southern California. They provide unique opportunities for non-motorized and motorized trail recreation in a primitive or semi-primitive setting, sources of clean drinking water, and large undisturbed landscapes that offer privacy and solitude. These areas support a diversity of habitats for native plants and animal species, conserve biological diversity and provide opportunities for study and education. The roadless areas in the Angeles, Cleveland, Los Padres and San Bernardino National Forests provide these values to differing degrees. Some areas have relatively large, mostly undisturbed environments, while many others are more diverse and have portions that reveal past or current development and in some cases, resource impacts.

Chapter 2, Comparison of Alternatives, Special Designations, differentiates the alternatives on the basis of recommended wilderness and displays a table summarizing the total acres of roadless areas recommended for wilderness designation by forest and alternative. Tables Angeles National Forest Recommended Wilderness by Alternative , Cleveland National Forest Recommended Wilderness by Alternative , Los Padres National Forest Recommended Wilderness by Alternative , and San Bernardino National Forest Recommended Wilderness by Alternative further detail the number of roadless areas recommended for wilderness designation by forest, acreage and alternative. The acreage is based on the findings of the wilderness evaluations combined with the emphasis of each alternative. Acres include any areas being proposed as wilderness, including IRAs, portions of IRAs, or other areas identified by the forests.

The effects analysis for inventoried roadless areas and recommended wilderness considers land within the boundaries of the Angeles, Cleveland, Los Padres and San Bernardino National Forests. Bureau of Land Management (BLM)-administered lands, National Parks and Monuments, and State of California Parks adjacent to and near the Forests are also considered. Private lands were not considered. Other Forests throughout the state of California will soon be initiating Forest Plan Revisions. However, they are physically separated from the southern California National Forests (by many miles) and any analysis of their roadless areas and potential wilderness recommendations would not affect the Forests in this Plan Revision. The National Wilderness Preservation System encompasses all federal lands. No roadless areas are currently being considered for Wilderness designation in southern California within public lands administered by the Bureau of Land Management, National Park Service, or State of California.

Areas recommended for wilderness designation in the Record of Decision (ROD) will be managed to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System until congressional action on the recommendations and the Wilderness Study Area. Any recommendation for wilderness designation is a preliminary administrative recommendation that will receive further review and possible modification by the Chief of the Forest Service, the Secretary of Agriculture, and the President of the United States (FSM 1923.11). Congress has reserved the authority to make final decisions on wilderness designation.

Appendix E. Wild and Scenic Rivers

Background and Study Process

Background

Congress enacted the Wild and Scenic Rivers Act (WSRA) in 1968 to preserve select river's free-flowing condition, water quality and outstandingly remarkable values. The most important provision of the WSRA is protecting rivers from the harmful effects of water resources projects. To protect free-flowing character the Federal Energy Regulatory Commission (which licenses nonfederal hydropower projects) is not allowed to license construction of dams, water conduits, reservoirs, powerhouses, transmission lines, or other project works on or directly affecting wild and scenic rivers (WSR). Other federal agencies may not assist by loan, grant, license or otherwise any water resources project that would have a direct and adverse effect on the values for which a river was designated.

The WSRA also directs that each river in the National Wild and Scenic Rivers System (National System) be administered in a manner to protect and enhance a river's outstanding natural and cultural values. It allows existing uses of a river to continue and future uses to be considered, so long as existing or proposed use does not conflict with protecting river values. The WSRA also directs building partnerships among landowners, river users, tribal nations, and all levels of government.

Beyond the immediate protection afforded to the eight rivers in the enabling legislation, the WSRA established a process for building a legacy of protected rivers. Rivers may be identified for study by an act of Congress under Section 5(a), or through federal agency-initiated study under Section 5(d)(1). By the end of 2002, Congress had authorized 138 rivers for study. Section 5(d)(1) directs federal agencies to consider the potential of WSRs in their planning processes, and its application has resulted in numerous individual river designations, and state and area-specific legislation.

Both Sections 5(a) and 5(d)(1) studies require determinations to be made regarding a river's eligibility, classification and suitability. Eligibility and classification represent an inventory of existing conditions. *Eligibility* is an evaluation of whether a river is free-flowing and possesses one or more outstandingly remarkable values (ORVs) including scenery, recreation, geology, fish and wildlife, history, cultural (prehistoric), or similar values. If found eligible, a river is analyzed as to its current level of development (water resources projects, shoreline development, and accessibility) and a recommendation is made that it be placed into one or more of three classes—wild, scenic or recreational.

The final procedural step, *suitability*, provides the basis for determining whether to recommend a river as part of the National System. A suitability analysis is designed to answer the following questions:

- Should the river's free-flowing character, water quality, and ORVs be protected, or are one or more other uses important enough to warrant doing otherwise?
- Will the river's free-flowing character, water quality, and ORVs be protected through designation? Is it the best method for protecting the river corridor? In answering these questions, the benefits and impacts of WSR designation must be evaluated and alternative protection methods considered.
- Is there a demonstrated commitment to protect the river by any non-federal entities that may be partially responsible for implementing protective management?

Rivers authorized for study by Congress are protected under the WSRA; specifically, Sections 7(b)—prevents the harmful effects of water resources projects: 8(b)—withdraws public lands from disposition under public land laws: 9(b)—withdraws locatable minerals from appropriation under mining laws; and 12(a)—directs actions of other federal agencies to protect river values. These protections last through the study process, including a three-year period following transmittal of the final study report by the President to Congress. The integrity of the identified classification must also be maintained during the protection period.

The identification of a river for study through the forest planning process does not trigger any protections under the WSRA. To manage the river for its potential inclusion into the National System, the Forest Plan should provide direction using other authorities to protect its free-flowing character, water quality, ORVs, and preliminary or recommended classification. The only exception is that if Congress designates river for further study, a minerals withdrawal goes into effect while eligibility and suitability are determined.

The Forest Service does not designate rivers. Rivers are added to the National System by act of Congress or by the Secretary of the Interior. Secretarial designation requires that a river be a part of a state river protection system and the state governor to make application to the Secretary. Therefore, for those rivers undergoing suitability studies, the decision to be made in the Final Forest Plan and EIS is whether to recommend each of these study rivers to Congress for designation as a Wild and Scenic River.

Study Process in southern California

Wild and scenic river planning for the southern California National Forests began during the development of their original land management plans. Three rivers located within the Los Padres National Forest were designated as a result of that effort.

Big Sur River

Designation: June 19, 1992

Reach: From the confluence of the South and North Forks downstream to the boundary of the Ventana Wilderness. The South Fork and the North Fork from their headwaters to their confluence.

Classification/Mileage: Wild -- 19.5 miles; Total -- 19.5 miles.

Located in the Ventana Wilderness, this river offers outstanding opportunities for hiking, camping, swimming and fishing. It is one of the longest coastal California streams lined with redwoods.

Sespe Creek

Designation: June 19, 1992

Reach: The main stem from its confluence with Rock Creek and Howard Creek downstream to where it leaves section 26, T5N, R20W.

Classification/Mileage: Wild -- 27.5 miles; Scenic -- 4.0 miles; Total -- 31.5 miles.

Interesting geologic formations, unusual gorges, and rich riparian vegetation provide excellent scenic diversity and recreation opportunities. This stream is considered an outstanding rainbow trout fishery and provides critical habitat for the endangered California condor.

Sisquoc River

Designation: June 19, 1992

Reach: From its origin downstream to the Los Padres National Forest boundary.

Classification/Mileage: Wild -- 33.0 miles; Total -- 33.0 miles.

Most of this river lies within the San Rafael Wilderness. It offers excellent opportunities for solitude, wilderness-oriented activities, and appreciation of the outstanding scenery.

Source: http://www.nps.gov/rivers/wildriverslist.html#ca

To date, no other rivers in the southern California National Forests have been designated as WSR's. In addition, the original Los Padres National Forest Plan found a 14-mile segment of Piru Creek eligible for WSR status. However, due to the close proximity of Sespe Creek with its high values and the potential for safety problems resulting from sudden water releases, the creek was not recommended for WSR designation. The Angeles and Cleveland National Forests determined no rivers as eligible for designation in their original land management plans. The San Bernardino National Forest determined several rivers as eligible for designation in their original land management plan as follows:

Santa Ana River

Segment above South Fork: Recreational

South Fork within the San Gorgonio Wilderness: Wild

Segment between Filaree Flats and Bear Creek: Wild

Bear Creek: Wild

Whitewater River

North Fork: Wild

Middle Fork: Wild

Segments of South/East Fork: Wild

Deep Creek

Segment between Running Springs and the T-6 Road crossing: Scenic

Segment between Splinter's Cabin and Devil's Hole: Scenic

Segment between Devil's Hole and the Mojave River: Scenic

Segment above Running Springs: Recreational

Segment between the T-6 Road crossing and Splinter's Cabin: Recreational

Lytle Creek

Middle Fork within the Cucamonga Wilderness: Scenic

South Fork: Scenic

An amendment to the land management plan stated that the North Fork of the San Jacinto River and a segment of Holcomb Creek below Forest System Road 3N16 would be re-evaluated for eligibility.

Public Law 102-301 mandated that five rivers within the Los Padres National Forest (Piru Creek – 49 miles, Little Sur – 23 miles, Matilija Creek – 16 miles, Lopez Creek – 11 miles, and Sespe Creek – 10.5 miles) be studied for eligibility and suitability. Those studies began in 1998 and are completed in this land management plan revision.

Eligibility Inventory

As a part of this land management plan revision, free-flowing streams with outstandingly remarkable values were identified in an eligibility inventory, the first phase of a two-phase study process of all rivers within the Angeles, Cleveland, Los Padres and San Bernardino National Forests. In all, 48 rivers were studied for wild and scenic river eligibility on the four National Forests.

In accordance with national direction and law, in order to be eligible for Wild and Scenic River status a river must be free-flowing and possess one or more outstandingly remarkable values (ORVs). Thus, the eligibility analysis consists of an examination of the river's hydrology, including any man-made alternations, and an inventory of its natural, cultural and recreational resources. The corridor width for study (and designated) rivers is usually ¼ mile on either side of the river, though final boundaries can and do vary from this average guideline. The determination that a river area contains ORV's was a professional judgment on the part of the interdisciplinary study teams on the four National Forests of southern California based on objective, scientific analysis, and relying on direction from the Act, the interagency guidelines, and Forest Service direction.

First, each forest broadly screened all the rivers within its boundaries to identify the level of significance as local, regional, or national, based on geographic information system (GIS) resource mapping and specialist review. At initial public meetings we presented this information along with Wild and Scenic River background information and mapping, and asked the public: if they had additional resource information that should be considered for evaluation of river eligibility for Wild and Scenic designation; which value(s) should be considered "outstandingly remarkable"; how should Wild & Scenic Rivers be managed; and what areas should be recommended for Wild & Scenic River designation? This resulted in identification of 47 Wild and Scenic River candidates either by the public or by the four Forests.

Next, based on interdisciplinary study and review of each of the 47 rivers (including multiple forks and segments), all rivers found to be free-flowing and to possess one or more ORVs were determined to be eligible. Each river found eligible was then reviewed for potential classification as a wild, scenic, or recreational

river. These eligibility inventories are based on Forest Service resource information or on information shared by members of the public having knowledge of individual rivers.

Using criteria in accordance with the *Wild & Scenic River Assessment Process, National direction letter of 11/21/96*, the interdisciplinary teams evaluated the resource value status of each candidate river and determined if the river had one or more outstandingly remarkable values. The direction allows criteria for additional river-related values to be developed. Accordingly, the four National Forests of southern California opted to add evaluation of botanical resources and created eligibility criterion for botany modeled after criteria for wildlife. In order to be assessed as outstandingly remarkable, a river-related value must be a unique, rare or exemplary feature that is significant at a comparative regional or national scale. The criteria detailed below apply to all candidate rivers but will not be repeated in each river summary information document for the sake of brevity.

1. Scenery

Criterion: The landscape elements of landform, vegetation, water, color and related factors result in notable or exemplary visual features and/or attractions. When analyzing scenic values, additional factors such as seasonal variations in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed may be considered. Scenery and visual attractions may be highly diverse over the majority of the river or river segment.

2. Recreation

Criterion: Recreational opportunities are, or have the potential to be, unique enough to attract visitors from outside of the region of comparison. Visitors are willing to travel long distances to use the river resources for recreational purposes. River-related opportunities could include, but are not limited to, sightseeing, wildlife observation, camping, photography, hiking, hunting, and boating/rafting. Interpretive opportunities may be exceptional and attract or have the potential to attract visitors from outside the region of comparison. The river may provide or have the potential to provide settings for national or regional usage or competitive events.

3. Geology

Criterion: The river or the area within the river corridor contains an example(s) of a geological feature, process, or phenomena that is rare, unusual, or unique to the region of comparison. The feature(s) may be in an unusually active stage of development, represent a "textbook" example and/or represent a unique or rare combination of geologic features (erosional, volcanic, glacial and other geological structures).

4. Fish and Wildlife

Criterion (fish): Fish values may be judged on the relative merits of either fish populations or habitat—or a combination of these river-related conditions.

***Populations*:** The river is nationally or regionally an important producer of resident and/or anadromous fish species. Of particular significance is the presence of wild stocks and/or federal or state listed or candidate threatened, endangered and sensitive (TES) species. Diversity of species is an important consideration and could, in itself, lead to a determination of outstandingly remarkable.

***Habitat*:** The river provides exceptionally high quality habitat for fish species indigenous to the region of comparison. Of particular significance is habitat for wild stocks and/or federal or state listed or candidate TES species. Diversity of habitats is an important consideration and could, in itself, lead to a determination of outstandingly remarkable.

The study team will consider the habitat and population of each river in the context of comparison to the known populations or habitats of the team's other study rivers and apply the following additional criterion. To be outstandingly remarkable, the segment will either have the wild/heritage trout waters designation by California State Fish and Game or have the presence of TES fish species of regional or national significance and at least one of the following factors: 1) the largest number of mating pairs locally or regionally, or the only mating pair; or 2) multiple populations of a TES species; or 3) the largest or most robust populations; or 4) high diversity of rare or not rare fish species or habitats present. Known or historically occupied habitat that is still suitable is to be considered, but modeled habitat is not to be considered.

Criterion (wildlife): Wildlife values may be judged on the relative merits of either wildlife populations or habitat—or a combination of these conditions.

Populations: The river or area within the river corridor contains nationally or regionally important populations of indigenous wildlife species. If particular significance are species considered to be unique or populations of federal or state listed or candidate threatened, endangered and sensitive (TES) species. Diversity of species is an important consideration and could, in itself, lead to a determination of outstandingly remarkable.

Habitat: The river or area within the river corridor provides exceptionally high quality habitat for wildlife of national or regional significance, or may provide unique habitat or a critical link in habitat conditions for federal or state listed or candidate TES species. Contiguous habitat conditions are such that the biological needs of the species are met. Diversity of habitats is an important consideration and could, in itself, lead to a determination of outstandingly remarkable.

The study team will consider the habitat and population of each river in the context of comparison to the known populations or habitats of the team's other study rivers and apply the following additional criterion. To be outstandingly remarkable, the river will have both the presence of TES wildlife species or habitat of regional or national significance and at least one of the following factors: 1) the largest number of mating pairs locally or regionally, or the only mating pair; or 2) multiple populations of a TES species; or 3) the largest or most robust populations; or 4) high diversity of rare or not rare wildlife species or habitats present. Known or historically occupied habitat that is still suitable will be considered, but modeled habitat will not be considered.

5. Heritage resources (Cultural)

Criterion: The river or area within the river corridor contains a site(s) where there is evidence of occupation or use by native Americans. Sites must have rare or unusual characteristics or exceptional human interest value(s). Sites may have national or regional importance for interpreting prehistory; may be rare and represent an area where a culture or cultural period was first identified and described; may have been used concurrently by two or more cultural groups; or may have been used by cultural groups for rare or sacred purposes.

6. Heritage resources (Historic)

Criterion: The river or area within the river corridor contains a site(s) or feature(s) associated with a significant event, an important person, or a cultural activity of the past that was rare, unusual or one-of-a-kind in the region. A historic site(s) and/or feature(s) in most cases are 50 years old or older.

7. Other (Botany)

Criterion: Botanical values may be judged on the relative merits of either plant populations or habitat—or a combination of these conditions.

Populations: The river or area within the river corridor contains nationally or regionally important populations of indigenous plant species. Of particular significance are species considered to be unique or populations of federal or state listed or candidate threatened, endangered and sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of outstandingly remarkable.

Habitat: The river or area within the river corridor provides exceptionally high quality habitat for plants of national or regional significance, or may provide unique habitat or a critical link in habitat conditions for federal or state listed or candidate threatened, endangered and sensitive species. Contiguous habitat conditions are such that the biological needs of the species are met. Diversity of habitats is an important consideration and could, in itself, lead to a determination of outstandingly remarkable.

The study team will consider the habitat and population of each river in the context of comparison to the known populations or habitats of the team's other study rivers and apply the following additional criterion. To be outstandingly remarkable, the river will have both the presence of TES plants or habitat of regional or national significance and at least one of the following factors: 1) community type examples rare in Southern California (i.e. large portions of TES occupied montane, wet meadow habitat) or 2) multiple populations of a TES species; or 3) the largest or most robust populations; or 4) high diversity of rare or not rare plant species or habitats present; or 5) unique situations (i.e. rare plants in bottom reaches of river dependent upon scouring of river for seed germination). Known or historically occupied habitat that is still suitable will be considered, but modeled habitat will not be considered.

Classification

The Act and Interagency Guidelines provide the following direction for establishing preliminary classifications

for eligible rivers:

Wild rivers: Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic rivers: Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational rivers: Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Study rivers were given a preliminary classification based on its condition and current level of development, in accordance with the table on the next page. Where levels of human activity vary within the study area, the study reach may be segmented into more than one class. Congress sometimes classifies the river at the time of designation based upon the study agency's report, but in cases where Congress does not do this, the responsible federal agency establishes the designated river's classification(s) when promulgating its boundaries.

Attribute	Wild	Scenic	Recreational
Water Resources Development	Free of impoundment.	Free of impoundment.	Some existing impoundment diversion. The existence of low dams, diversions, or other modifications of the waterway is acceptable, provided the waterway remains generally natural and riverine in appearance.
Shoreline Development	Essentially primitive. Little or no evidence of human activity. The presence of a few inconspicuous structures, particularly those of historic or cultural value, is acceptable. A limited amount of domestic livestock grazing or hay production is acceptable. Little or no evidence of past timber harvest. No ongoing timber harvest.	Largely primitive and undeveloped. No substantial evidence of human activity. The presence of small communities or dispersed dwellings or farm structures is acceptable. The presence of grazing, hay production, or row crops is acceptable. Evidence of past or ongoing timber harvest is acceptable, provided the forest appears natural from the riverbank.	Some development. Substantial evidence of human activity. The presence of extensive residential development and a few commercial structures is acceptable. Lands may have been developed for the full range of agricultural and forestry uses. May show evidence of past and ongoing timber harvest.
Accessibility	Generally inaccessible except by trail. No roads, railroads or other provision for vehicular travel within the river area. A few existing roads leading to the boundary of the river area is acceptable.	Accessible in places by road. Roads may occasionally reach or bridge the river. The existence of short stretches of conspicuous or longer stretches of inconspicuous roads or railroads is acceptable.	Readily accessible by road or railroad. The existence of parallel roads or railroads on one or both banks as well as bridgecrossings and other river access points is acceptable.

Water Quality	Meets or exceeds federal criteria or federally approved state standards for aesthetics, for propagation of fish and wildlife normally adapted to he habitat of the river, and for primary contact recreation (swimming) , except where exceeded by natural conditions.	No criteria prescribed by the Act. The Federal Water Pollution Control Act Amendments of 1972 have made it a national goal that all waters of the United States be made fishable and swimmable. Therefore, rivers will not be precluded from scenic classification because of poor water quality at the time of their study, provided a water quality improvement plan exists or is developed in compliance with applicable Federal and state laws.	No criteria prescribed by the Act. The Federal Water Pollution Control Act Amendments of 1972 have made it a national goal that all waters of the United States be made fishable and swimmable. Therefore, rivers will not be precluded from recreational classification because of poor water quality at the time of their study, provided a water quality improvement plan exists or is developed in compliance with applicable Federal and state laws.

Twenty six rivers were determined to be free flowing and to have one or more outstandingly remarkable value and thus be eligible for addition to the National WSR System. The following tables displays the rivers found eligible in whole or part along with mileage by potential classification:

- Table 355: Candidate Wild and Scenic Rivers - Angeles National Forest
- Table 356: Candidate Wild and Scenic Rivers - Cleveland National Forest
- Table 357: Candidate Wild and Scenic Rivers - Los Padres National Forest
- Table 358: Candidate Wild and Scenic Rivers - San Bernardino National Forest

Only those rivers found eligible will proceed to the suitability study phase.

Suitability

The final phase of study addresses the suitability of a river for inclusion in the National Wild and Scenic Rivers System. The Los Padres National Forest completed the suitability studies for the seven rivers determined eligible on that forest, including evaluation for suitability under the alternatives developed for this plan revision (see Summary of Los Padres Wild and Scenic River Suitability Study). The seven rivers studied are all or portions of the Arroyo Seco River, Indian Creek, Little Sur River, Mono Creek, Piru Creek, San Antonio River, and Upper Sespe Creek. A description of the alternatives by classification and miles recommended may be found in Chapter 2 of the DEIS. In addition, the effects of designation of the rivers recommended to Congress under each alternative are described and analyzed in the applicable sections in Chapter 3 of the DEIS.

The suitability study phase will be initiated at a later date for the 19 eligible rivers on the Angeles, Cleveland, and San Bernardino National Forests. However, the Forest Plan will provide management direction to protect the free-flowing character, potential classification, and outstandingly remarkable values of eligible rivers until a suitability study is completed and final recommendation to Congress regarding river designation is made.

Wild and Scenic River Study Documentation

Each of the 47 candidate rivers evaluated has a Summary Information Document that provides a synopsis of the pertinent information related to eligibility, classification and/or suitability (as applicable). All Summary Information Documents are available in the Reading Room on our Forest Plan Revision website at http://www.fs.fed.us/r5/scfpr.

The draft Environmental Impact Statement appendix includes the Summary Information Documents for the suitability studies undertaken by the Los Padres National Forest and the summary tables for all the candidate rivers. Due to budget constraints, not all the Summary Information Documents are published in the print version.

Summary of Wild and Scenic River Eligibility Inventory by Forest

The following tables summarize the key data and findings of the eligibility inventories completed on the four forests.

- Table 164: Eligibility Inventory Summary for Candidate Wild and Scenic Rivers, ANF
- Table 165: Eligibility Inventory Summary for Candidate Wild and Scenic Rivers, CNF
- Table 166: Eligibility Inventory Summary for Candidate Wild and Scenic Rivers, LPNF
- Table 167: Eligibility Inventory Summary for Candidate Wild and Scenic Rivers, SBNF

Recommended Wild and Scenic Rivers by Alternative

As a part of this analysis, the Los Padres completed the suitability studies for the seven rivers found eligible for wild and scenic river designation on that forest. This appendix contains the Suitability Report, which describes in detail the anticipated effects of designation or non-designation of each river with respect to the six suitability factors referred to in Section 4 of the Wild and Scenic Rivers Act. If the management alternative selected recommends a river for WSR designation, that river would be protected at its recommended classification pending Congressional decision.

Whether a river (or selected river segments) is recommended for designation in a given alternative is a reflection of the alternative theme and evaluation of the suitability factors, recognizing other possible combinations for a particular river may exist. Given the theme of the alternatives, alternative 1 and 5 recommend designation of no new wild and scenic rivers. Alternative 2 recommends for designation key wild and scenic rivers and classifications that provide a balance of recreation and scenery values in order to protect and enhance the free-flowing character, water quality and outstandingly remarkable values while minimizing conflicts and loss of other uses. Alternative 3 recommends for designation a significant number of wild and scenic rivers, emphasizing botany, fisheries and wildlife outstandingly remarkable values. Classifications balance the need to protect and enhance the free-flowing character, water quality and outstandingly remarkable values with the conservation of a wide range of wildlife and plant species (especially TES) and habitats, biodiversity, linkages and corridors. Alternative 4 recommends for designation a few wild and scenic rivers, emphasizing recreation and/or scenery as outstandingly remarkable values. Classifications recognize the need to protect and enhance the free-flowing character, water quality and outstandingly remarkable values. Alternative 6 recommends for designation a significant number of wild and scenic rivers that contain outstandingly remarkable values that protect and enhance a wide range of values and features, including species conservation, biodiversity, open space, natural beauty, recreation and research. The seven rivers each have multiple river segments and three possible classifications, thus presenting several possibilities for structuring alternatives at the land management plan level. A stream might be shown with a wild river classification in one alternative, a scenic river classification in another alternative, and may not be included in another alternative.

Chapter 2 of the DEIS compares the overall recommended wild and scenic river mileage by classification and alternative. Further comparative detail by river, classification and alternative is found in this appendix.

Alternative 1 recommends designation of no miles.

Alternative 2 recommends designation of segments of Arroyo Seco River, Piru Creek, Upper Sespe Creek, Indian Creek, and Mono Creek,for a total of 101.9 miles.

Alternative 3 recommends designation of all eligible segments of Arroyo Seco River, Little Sur River, Piru Creek, Upper Sespe Creek, Indian Creek, and Mono Creek,for a total of 115.5 miles.

Alternative 4 recommends designation of all eligible segments of Arroyo Seco River, Piru Creek, and Upper Sespe Creek, for a total of 68.4 miles.

Alternative 5 recommends designation of no miles.

Alternative 6 recommends designation of all eligible segments of Arroyo Seco River, Little Sur River, San

Antonio River, Piru Creek, Upper Sespe Creek, Indian Creek, and Mono Creek, for a total of 124.1 miles.

See table 103: Suitability Study Summary for Candidate Wild and Scenic Rivers, LPNF.

Any management activities within a river corridor must be consistent with the protection and enhancement of the river's free flow and outstandingly remarkable values in order for the river to maintain its eligibility. The types and amounts of activities and changes acceptable within a river corridor depend on whether it is recommended as a wild, scenic, or recreational river. Because effects of land management plan alternatives are not site specific, it is not possible to describe precisely how an individual stream may be affected by future projects, since the exact locations and designs of those projects are not yet determined. It is possible, however, to analyze the environmental consequences of the alternatives based on the differences in recommended mileage and classification, along with consideration of the protection measures and general restrictions on management activities associated with each class of WSR.

The effects of the designation of recommended wild and scenic river mileage in each alternative are described in Chapter 3 of the draft environmental impact statement in the applicable sections.

Study Reports (Los Padres National Forest)

Arroyo Seco River

Arroyo Seco River Study Area Summary

In November of 1993, the Los Padres National Forest published Amendment No. 2 to the Forest Land and Resource Management Plan identifying the Arroyo Seco River for eligibility and suitability evaluation as a potential addition to the National Wild and Scenic River System.

Name of River: Arroyo Seco River

Location: State of California, Monterey County, Los Padres National Forest

The Arroyo Seco River is considered to be free flowing below a point in the Ventana Wilderness along the east flank of the Santa Lucia Range (southeastern one-quarter of T21S, R4E, Sec 14, MDBM) and flows in a northerly direction leaving the Los Padres National Forest at the southeastern boundary of T19S, R5E, Sec 31. For the purposes of this study, the Arroyo Seco River was divided into four segments.

Segment 1: This segment includes the Arroyo Seco River from its headwaters to the Sportsman's Lodge. This segment is within the Ventana Wilderness Area.

Segment 2: A length of river 0.25 miles upstream and downstream of the impoundment at the Sportsman's Lodge located in T21S, R5E, Sec 7. This segment is outside of the Ventana Wilderness Area.

Segment 3: Beginning 0.25 miles downstream of the impoundment at the Sportsman's Lodge to the wilderness boundary located in T20S, R4E, Sec 2.

Segment 4: Beginning at the wilderness boundary to the administrative boundary located along the eastern boundary of T19S, R5E, Sec 31.

River Mileage:

See table 447: Arroyo Seco River - Segment Description

Studied: 18.4 miles

Eligible: 18.4 miles

Arroyo Seco River Eligibility Inventory

Determination of Free-flow:

There are no impoundments in segments 1, 3 and 4; the river is free flowing in these segments. In segment 2 there is a run of the river impoundment adjacent to the Sportsman's Lodge. The structure consists of a concrete foundation with slats to seasonally impound the river (the current use of the structure is unknown). Segment 2 is also considered to be free flowing.

Determination of Outstandingly Remarkable Values (ORVs):

1. Scenery

Description**:** Approximately 80% of the Arroyo Seco River is scenic attractiveness class "A" landscape, within the Southwest Mountain and Valley Character Type. It is distinctive primarily because of the presence of water, although many sections contain remarkable examples of landform, rocks and riparian vegetation.

The headwaters to Forks Camp offer undisturbed views of the Pacific Ocean and Sierra Peak. There is little presence of water and views of steep landscapes and hardwoods. At Forks Camp, the land flattens with views of meadows and many tributaries into the stream. Here you begin to hear the river, pools form among large granite boulders. Hardwoods line the river, but views are of slopes covered with chaparral. As the river flows further, there are abundant trees and tall ferns. The vegetation and deep pools are the features of this section, with seasonal color adding variety to the experience. At Lost Valley Trail, the boulders are smaller but many, and the river becomes a fifty foot channel with deep gorges. The gorges are 500 to 600 feet deep with nearly vertical walls. The drama is like being in a grand canyon. Some pools in this section are 300 feet deep.

At the horse bridge, the gorges open up and large boulders are scattered through the river. Grass slopes are visible through riparian vegetation as the bridge arches over the river. The next section of the river is punctuated with rapids, 50-foot gorges, small beaches and a multitude of twists and turns. The views from the river are of steep slopes with some rock outcrops. Next appears an 800-foot gorge with steep walls of limestone and red colors in horizontal lines. The river finally opens wide into the recreation area and is more like a park in appearance.

Most noteworthy throughout the river is the overall ruggedness, combination of oaks, sycamores and riparian vegetation, especially around deep pools. Overall, the rugged appearance leaves a feeling of the power of the river.

Determination: The scenic features of Arroyo Seco River are considered to be outstandingly remarkable because of the combination of steep canyon walls, gorges, rock outcrops, and jumbles of boulders that create pools, and dramatic sounds within a dynamic scenic setting.

2. Recreation:

Description: Recreation use is heavy in the Arroyo Seco River corridor, especially in the Arroyo Seco Recreation Area. Near its source the river is a rushing stream that slices through dry, brush-covered mountains. Narrow gorges hide cool, dark pools. Waterfalls spill down flume like channels in sandstone.

The extreme change in elevation creates much of the scenic beauty that recreationists enjoy. From Junipero Serra Peak to the Arroyo Seco canyon bottom is more than a 5,000-foot elevation change.

Although there is no trail that follows the entire stretch of the Arroyo Seco River, there are many well-used access points via the Arroyo Seco/Indians Road. At one end of the Arroyo Seco/ Indians Road, the Arroyo Seco Trail follows the upper reaches of the river, intersecting at the Coast Ridge Trail. The Lost Valley Trail starts at the Escondido Campground.

Marble Peak Trailhead is located at the horse bridge near the confluence of Tassajara Creek and the Arroyo Seco River. There are large pools both upstream and downstream from this point. It is common on weekends to have 30 vehicles parked at the Marble Peak Trailhead. At least 50% of these vehicles are associated with Forest visitors who come for day use type of activities along the river.

The Arroyo Seco Gorge area is very popular for sunbathing and swimming. Many visitors find relative isolation from administrative controls in the gorge area, and they use the area as an alternative location to recreate with a minimum of regulatory interferences. There is no designated trail leading to the gorge at this time. The attraction of the river is so strong that forest visitors will travel cross-country down steep, unstable slopes to reach the river.

The most popular access point for recreation is at the Arroyo Seco day use area. Once again the main attraction is

the Arroyo Seco River not only for the day use site but also for forest visitors who camp in the overnight campground. The most common recreation activities are picnicking, swimming and sunbathing on the sandy beaches. The managed use season is year-round and use has averaged 50,000 Recreation Visitor Days (RVDs) per year since 1982. The area had a history of use of over 1,000 people per weekend. The day use area has recently been rehabilitated and provides for 900 people at one time (PAOT). An estimated 70% of the visitors are from Monterey County and an additional 20% are from surrounding counties within a 150-mile radius.

Determination: The recreation opportunities are considered to be outstandingly remarkable. The environmental space is inspiring, and the scale and contrast offer a feeling of insignificance. This is especially true in many sections of the gorge area and the many deep pools upstream. Steep cliffs and deep pools for swimming are unusual in a predominantly chaparral landscape.

3. Geology

Description: The Monterey District of the Los Padres National Forest is in the southern Coast Ranges of California. This is a geologically young mountain range that was uplifted to its present height about 400,000 years ago. The range includes Mesozoic age rocks that represent a subduction zone complex (the Franciscan Complex), a magmatic arc (plutonic and metamorphic rocks of the Salinian Block) and forearc basin sediments (the Great Valley Sequence). It also includes younger Tertiary marine sediments and Quaternary largely non-marine sediments. The majority of the Monterey District is part of the Salinian Block. The Arroyo Seco, Carmel, Little Sur and San Antonio Rivers, and Tassajara Creek primarily flow through the basement rocks of this block.

Arroyo Seco River first flows generally northeast and perpendicular to beds of Cretaceous and Tertiary marine sedimentary rocks. It then bends to flow northwest, apparently controlled by the contact between the Tertiary Reliz Canyon Formation and Rincon Shale. Further downstream along this trend it flows through exposed Salinian Block basement rocks (granite and Mesozoic or older metasedimentary rocks) and Franciscan Complex rocks. A landslide is located adjacent to the stream in the southwest one-quarter of the Junipero Serra Peak quad. This feature is in an area with abundant shale units (Church Creek Formation, Rincon Shale and the Lucia Shale member of the Reliz Canyon Formation) and the highly fractured Franciscan Complex. Beyond this, the river flows northwest and then north into mostly Mesozoic or older metasedimentary rocks and granite in the Tassajara Hot Springs quad. A fault deflects the course of the river into a northeast trend (in the Junipero Serra Peak quad) through the metasedimentary rocks. From the area near The Lakes to the forest boundary it flows east through steeply dipping Tertiary sedimentary rocks (Vaqueros Sandstone and the Mint Canyon, Monterey and Berry formations).

Determination: The river corridor possesses outstandingly remarkable geologic values. The Salinian Block is unique because it appears to have been displaced 200 kilometers northwestward along the San Andreas Fault from its original position between the Sierra Nevada and the Peninsular Ranges. Rocks in the Salinian Block have been structurally deformed by en echelon faults and folds as a result of transform (strikeslip) faulting. The Salinian Block also has anomalous seismic properties that show in a marked decrease in seismic amplitudes. One possible explanation is that the Franciscan Complex underlies the block. The Salinian Block is significant at the central and southern California geographic level.

4. Fish and Wildlife

Description: The Arroyo Seco flows year-round through large areas of open oak woodlands separated by low ridges mostly covered in chaparral. Along the river course, habitat types primarily consist of riparian and mixed hardwoods, such as white alder, live oak, sycamore, and California laurel.

The Arroyo Seco is the first major spawning tributary that California South-Central Coast steelhead (*Oncorhynchus mykiss*), a federally threatened species, can access as they move up the Salinas drainage from the Pacific Ocean. The Arroyo Seco (excluding its tributaries) provides 4.5 miles of steelhead habitat on the Los Padres National Forest, from the forest boundary upstream to an identified fish barrier one and one half mile upstream from the confluence with Willow Creek. This habitat is within study segment 4. Steelhead have access to high quality spawning areas in Santa Lucia Creek, Tassajara Creek, and Willow Creek, all of which are tributaries to the Arroyo Seco below the identified barrier. The Arroyo Seco upstream of the barrier, as well as tributaries to this upper reach (Segments 1 and 2), provide excellent trout habitat, but are not accessible to steelhead.

Downstream of the Los Padres National Forest boundary, steelhead habitat has been severely degraded by water diversions, road crossings, groundwater pumping for agricultural uses (especially newly created, large vineyards) and housing, and pesticide contamination. River corridor conditions on the Los Padres are relatively pristine, and represent some of the last remaining intact steelhead habitat in the larger Salinas River Drainage.

The riparian corridor along the Arroyo Seco River provides habitat for the California spotted owl(*Strix occidentalis occidentalis*), a Forest Service sensitive species, for foraging and nesting. In 1993, a pair of owls was found within the gorge area of the Arroyo Seco River.

Southwestern pond turtles (*Clemmys marmoratta pallida*), a Forest Service sensitive species, are found in suitable habitats within the upper tributaries of the Arroyo Seco River around Memorial Campground. Suitable habitat for this species occurs throughout the Arroyo Seco River from Memorial Park to the boundary of the Los Padres National Forest.

Determination: The habitat for federally threatened steelhead is considered to be outstandingly remarkable. The Arroyo Seco River is the middle link of an anadromous fishery continuum between the Tassajara Creek, Salinas River and Pacific Ocean.

5. Heritage resources (Cultural)

Description: The Arroyo Seco River has been an important resource prehistorically. Archaeological remnants of Salinan and Esselen occupations, including bedrock mortars and rockshelters, dot the river along its entire course. Ethnographic studies conducted in the early 1900s provided Salinan place names for areas along the Arroyo Seco, suggesting the ongoing importance of this area in Salinan culture.

Within the relevant portion of the stream corridor, bedrock mortars are the most common known prehistoric and/or ethnographic site type. Bedrock mortars are common in California, but seldom receive subsurface testing, so that their potential significance is usually not fully examined. Any cases in which plant remains have been preserved and can be conceptually associated with the mortars could tell us much about prehistoric food processing.

Also present is a rockshelter (site 51-100) that is listed on the National Register of Historic Places. Excavation has revealed exceptionally well-preserved material remains; these remains are also diverse and abundant, and may represent a long span of use. This site and the associated artifacts offer an exceptional quantity of information regarding past activities within the drainage, and the practices of the relevant cultural group(s). The site is thus significant at the local and regional levels. Further, this site offers potential for on-site interpretation of local and regional prehistory. (Since excavation and, unfortunately, looting are believed to have removed most of the cultural materials, calling attention to the site should not increase the potential for looting).

Based on the current level of knowledge of the stream corridor, none of these features or characteristics is recommended as outstandingly remarkable; however, the informational and interpretive potential of site 51-100 warrants future attention.

Determination: Cultural values are not considered to be outstandingly remarkable.

6. Heritage resources (Historic)

Description: The Arroyo Seco River has been an important resource historically. Historic sites include the Arroyo Seco Guard Station complex (1931). This complex includes a historic Forest Service building that still retains distinctive characteristics of the era. Based on the current level of knowledge of the stream corridor, none of these features or characteristics is recommended as outstandingly remarkable.

Determination: Historic values are not considered to be outstandingly remarkable.

7. Other (Botany)

Description: Riparian vegetation consists of alder, sycamore, and various species of willow and oak. The 1977 Marble Cone Fire affected all of this vegetation and 1,600 acres were burned during a 1985 incident. Not all of the riparian plants were burned during these fire events and much of it is relatively mature in age with moderately well developed vertical and horizontal diversity.

The *Arroyo Seco Watershed Analysis* (2000) identified five sensitive plant species as being present in the Arroyo Seco watershed. None of these five have been found to occur within one-quarter mile of Arroyo Seco River and none of these five are associated with riparian habitats.

No systematic efforts have been made to inventory the botanical resources of the Arroyo Seco River. Surveys for fuels management have been focused on areas immediately adjacent to Arroyo Seco Road and have not included the riparian corridor and its adjoining uplands.

Determination: Botanical values are not considered to be outstandingly remarkable.

Summary of Outstandingly Remarkable Values:

Scenery

The scenic features of Arroyo Seco River are considered to be outstandingly remarkable because of the combination of steep canyon walls, gorges, rock outcrops, and jumbles of boulders that create pools, and dramatic sounds within a dynamic scenic setting.

Recreation

The recreation opportunities are considered to be outstandingly remarkable. The environmental space is inspiring, and the scale and contrast offer a feeling of insignificance. This is especially true in many sections of the gorge area and the many deep pools upstream. Steep cliffs and deep pools for swimming are unusual in a predominantly chaparral landscape.

Geology

The Salinian Block metasedimentary and plutonic rocks exposed by the Arroyo Seco River are outstandingly remarkable. The Arroyo Seco River cuts through a complex geological cross-section in the Coast Ranges. The river exposes the relationship of rocks and geologic structural features in the Salinian Block that are important as research areas to aid in understanding important tectonic and seismic processes along the California continental margin. Abundant vegetation and steep terrain often obscures these rocks in other locations.

Fish

The habitat for federally threatened steelhead of is considered to be outstandingly remarkable. The Arroyo Seco River is the middle link of an anadromous fishery continuum between the Tassajara Creek, Salinas River and Pacific Ocean.

Potential Classification by River Segment (based on Interagency Guidelines criteria)

Segment 1 - Wild

Segment 2 - Recreation

Segement 3 - Scenic

Segment 4 - Recreation

See table 436: Arroyo Seco River - Potential Classification by River Segment for details.

Arroyo Seco River Suitability Report

Description

Landownership and Land Uses

Segment 1: This segment includes the Arroyo Seco River from its headwaters to the Sportsman's Lodge for a total distance of 2.5 miles (781 acres). Segment 1 is totally within the Ventana Wilderness.

Segment 2: A length of river 0.25 miles upstream and downstream of the impoundment at the Sportsman’s Lodge located in Township 21 S., Range 5 E., Section 7 (149 acres). Segment 2 lies within the administrative boundary of the Los Padres National Forest and is outside of the Ventana Wilderness. The Sportsman's Lodge is under special use permit from the Los Padres National Forest.

Segment 3: Beginning 0.25 miles downstream of the impoundment at the Sportsman's Lodge to the Ventana Wilderness boundary approximately one-quarter mile above the confluence with Tassajara Creek for a total distance of 10.5 miles (2965 acres). There are several non-federal parcels in the last mile within the administrative boundary of the Los Padres National Forest.

Segment 4: Segment 4 begins at Ventana Wilderness boundary approximately one-quarter mile above the confluence with Tassajara Creek and extends to the administrative boundary of the Los Padres National Forest along the eastern boundary of Township 19 S., Range 5 E., Section 31.

The river mile location is from the source (see table).

Mineral and Energy Resource Activities

There is no history of locatable minerals. Potential for mineral, oil or gas development within the corridor is low. There is a sand and gravel operation downstream from the National Forest boundary.

Water Resources Development

There are no known plans for hydroelectric or other water development.

Transportation, Facilities and Other Developments

The Arroyo Seco/Indians Road (19S09) is within the river corridor from the forest boundary at Arroyo Seco Station to the Marble Peak trailhead (approximately 3 miles). From Marble Peak trailhead to Escondido Campground, the road is outside the river corridor but parallels the river. From Escondido Campground to the Sportsman's Lodge, the road is within the river corridor (approximately 3 miles). The road corridor is outside of the Ventana Wilderness.

The south end of the road from Memorial Campground to Escondido Campground is seasonally open (May-November). The remainder of road is temporarily closed to motorized vehicles pending an environmental assessment to address potential impacts of removing the existing slide material from the road above the Arroyo Seco Campground to Escondido Campground. There have been periodic landslides on this road.

From the Sportsman's Lodge, the river corridor is accessed by the Arroyo Seco Trail (4E10) and at this point enters the Ventana Wilderness. The trail is located within the river corridor to its boundary south of Madrone Camp. Other trails that access the river corridor are the Rocky Creek Trail (E04), Marble Peak (4E07), Santa Lucia Trail (5E03), and Lost Valley trail (4E08). Two trails cross the river, Marble Peak at Horse Bridge and Lost Valley trail approximately one mile west of Escondido Campground. Approximately seven miles of trail exist within the river corridor. Two backcountry trail camps exist within the river corridor (Forks and Madrone).

Developed recreation facilities within the river corridor include:

Arroyo Seco Campground – 49 units, newly remodeled with showers, flush toilets.

Escondido Campground – 9 units, no potable water, vault toilets.

Memorial Campground – 8 units, no potable water, vault toilets.

These campgrounds are not visible from the river itself. The Arroyo Seco Day Use Area is visible from the river, near the boundary by Arroyo Seco Station.

Recreation Activities

Recreation use is concentrated from the Arroyo Seco Recreation Area to just upstream of Horse Bridge. Use in this area consists primarily of hiking, backpacking, picnicking, and swimming. From this point heading upstream to Escondido, use of the river is constrained by very limited access. Use is moderate from Escondido Campground to the headwaters. Use in this area consists primarily of hiking, backpacking and picnicking. The day use area and campground at the Arroyo Seco Recreation Area has a history of use by over 1,000 people per weekend. This area has recently been rehabilitated and has a capacity for 900 people.

Other Resource Activities

Prescribed burning is planned within the river corridor between Escondido and Memorial Campgrounds. Vegetation management including brush cutting and pile burning occurs in the vicinity of the Arroyo Seco Recreation Area.

Special Designations

Segment 1 is within the Ventana Wilderness. Segment 2 is on National Forest System lands with no special designation. Segment 3 is now within the Ventana Wilderness from one-quarter mile downstream from the Sportsman's Lodge impoundment (i.e., downstream from boundary of segment 2) to approximately 0.25 miles

upstream from the confluence with Tassajara Creek. Segment 4 downstream of this point has no special designation.

Socio-Economic Environment

Located within 12 miles, Greenfield (population ~10,000) is the closest town. Fort Hunter Liggett is approximately 15 miles from the river corridor. The Salinas Valley is a heavily developed agricultural area. New housing developments are increasing along the river outside of the administrative boundary of the Los Padres National Forest. There is a high migrant population in the Salinas Valley. The population in the Salinas Valley is rapidly increasing with the associated urbanization from San Jose.

There is a small housing development on the Arroyo Seco Road just east of the administrative boundary of the Los Padres. There are about 50 houses with most being full time residences. About two miles east of the administrative boundary is a restaurant/bar and mobile home park known as Millers Lodge.

Designation of the Arroyo Seco River as a Wild and Scenic River would have a negligible effect on the local economy. Use patterns within the Ventana Wilderness area would be unchanged. Designation as a recreational or scenic river would not affect use patterns in the Arroyo Seco Recreation Area. A scenic designation could limit recreational developments downstream of the Ventana Wilderness.

Current Administration and Funding Needs if Designated

	Expenses Independent of Designation	Additional Expenses with Designation
General Administration *	**$27,300**	**$23,700**
Development of River Management Plan	**$0**	**$100,000**
Development Costs	**$0**	**$5,000**
Operation and Maintenance Costs	**$136,500**	**$13,500**
Total Cost First Five Years	**$163,800**	**$265,900**

* General administration and operation and maintenance costs are estimated to continue at $30,000 annually.

Suitability Factor Assessment:

1. Characteristics that do or do not make the area a worthy addition to the National System.

Worthy: The habitat for federally threatened steelhead is considered to be outstandingly remarkable. The Arroyo Seco River is the middle link of an anadromous fishery continuum between the Tassajara Creek, Salinas River and Pacific Ocean. Designation would support efforts to maintain and improve habitat.

The scenic features of Arroyo Seco River are considered to be outstandingly remarkable because of the combination of steep canyon walls, gorges, rock outcrops, and jumbles of boulders that create pools, dramatic sounds within a dynamic scenic setting. Designation would help preserve the scenic values.

The recreation opportunities are considered to be outstandingly remarkable. The environmental space is inspiring, and the scale and contrast offer a feeling of insignificance. This is especially true in many sections of the gorge area and the many deep pools upstream. Steep cliffs and deep pools for swimming are unusual in a predominantly chaparral landscape. Designation as a recreational river would allow for development of high standard recreation facilities, where appropriate, within the river corridor. This is important in segment 4 where developed facilities already exist.

Not worthy: The Salinian Block metasedimentary and plutonic rocks exposed by the Arroyo Seco River are outstandingly remarkable. The Arroyo Seco River cuts through a complex geological cross-section in the Coast Ranges. However, these features are already protected by wilderness designation.

2. The current status of land ownership and use in the area.

The facilities at the Sportsman's Lodge include an access road, main cabin, covered pavilion, and utility infrastructure. The parcel in the north one half of T20S, R4E, 1/2 of Sec 1 contains no improvements within the study corridor. The non-federal lands within T19S, R4E, Sec 31 and the northeast corner of T20S, R4E Sec 6 contain numerous small residential parcels within the study corridor.

If designated, the values of the river corridor would be protected through the administration of the Sportsman's Lodge permit. No improvements are anticipated on the parcel in Section 1. The residential development near the terminus of the study corridor is well established and plans for future developments are unknown.

The Nature Conservancy is actively acquiring property downstream of the administrative boundary of the forest.

3. The reasonable foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed if the area were included in the System.

Potential dams and other water developments would be curtailed but there are no current proposals for this kind of development. All of segment 1 and most of segment 3 are within the Ventana Wilderness. This precluded any uses that do not meet wilderness use criteria. This includes dams, developed recreation facilities, and anything that detracts from wilderness character.

The continued use of the Arroyo Seco – Indians road may be curtailed by designation. The two ends of this road would be within the river corridor and designation as a wild river prohibits roads within the river corridor. This road is part of the forest transportation system and is a connector between the Arroyo Seco road and Fort Hunter-Liggett. The road is also critical for access to the Ventana Wilderness for wildland firefighting. It has been used for access to the Ventana Wilderness on every major wildfire in the east side of the wilderness. Designation could also influence future development of recreational facilities at the Arroyo Seco Recreation Area.

Monterey County has a special use permit to pump water from the Arroyo Seco River into Lower Abbott Lake. This lake is an impoundment adjacent to the Arroyo Seco Recreation Area. It has been a popular fishing spot for people using the recreation area. Water has not been pumped for several years, but the Monterey County Fish and Game Commission has expressed interest in restarting the pumps. The pumps are located within the proposed corridor (segment 4), so designation could affect this pumping operation.

4. The federal agency that will administer the area, should it be added to the System.

USDA Forest Service.

5. The extent to which the agency proposes that administration of the river, including the costs thereof, be shared by State and local agencies.

No proposal to share costs exists. Arroyo Seco-Indians road is maintained by Monterey County Public Works.

6. The estimated cost to the United States of acquiring necessary lands and interests in land and of administering the area, should it be added to the system.

This area is not prioritized for land acquisition since there is only one small private parcel within the corridor. The cost to purchase this parcel is unknown.

7. A determination of the degree to which the State or its political subdivisions might participate in the preservation and administration of the river, should it be proposed for inclusion in the System.

Participation not expected.

8. State and/or Local government's ability to manage and protect the outstandingly remarkable values on non-federal lands.

There is continuing development outside the forest boundary including a residential subdivision and grape vineyards. This development is a concern for non-governmental land/resource protection agencies as well as state resource management agencies. The Monterey County General Plan zones the areas downstream from the National Forest boundary as "rural" and "resource" lands. Resource lands are to be used for agricultural purposes, mining and resource conservation. Rural lands are primarily used for grazing and very low-density residences.

9. The consistency of designation with other agency plans, programs or policies.

Designation of these segments would be consistent with the Los Padres National Forest Land and Resource

Management Plan. It would also be consistent with the county General Plan.

10. Support or opposition to designation.

There is both strong support and strong opposition to additional river protection designations. Environmental groups support the designation of the segments listed in this study. There is opposition to designation from local ranchers/farmers as they see this as a precursor for designation of downstream segments.

A citizens group has been formed to advocate for designation of the portion of the river downstream from the National Forest as a Wild and Scenic River. Local farmers/ranchers along the river are opposed to designation because of potential for restrictions on uses of private land.

11. Potential for water resources development.

There are no known plans for water development in these segments. Water developments are no longer allowed in segment 1 and 3 due to designation as wilderness.

Forest Plan Alternatives

Briefly describe how a particular river was treated in each of the Forest Plan alternatives:

Alternative 1: No segments recommended for designation.

Alternative 2: Segment 1 is recommended for wild river designation, consistent with the existing wilderness. Segment 3 is recommended for scenic river designation to allow for limited maintenance on the Arroyo Seco Indians Road and trailheads. No designation recommended for all of segment 2 and 4. No designation through segment 2 would allow for future use and development of the Sportsmen's Lodge permit area. Segment 4 contains several private parcels and is a highly used, developed recreation area. No designation would minimize conflicts with private landowners. The recommended designations provide the best balance of recreation and scenery values with the need to protect and enhance the free-flowing character, water quality and outstandingly remarkable values.

Alternative 3: The Arroyo Seco River has fisheries as an ORV. Segment 1 is recommended for wild river designation, consistent with the existing wilderness. Segments 2 and 4 are recommended for recreational river designation. This designation would provide additional protection for the free-flowing character and ORVs while still allowing for recreational development. Segment 3 is recommended for scenic river designation to allow for limited maintenance on the Arroyo Seco Indians Road and trailheads. The recommended designations balance the need to protect and enhance the free-flowing character, water quality, and outstandingly remarkable fish habitat and habitat linkages.

Alternative 4: The Arroyo Seco River has recreation and scenery as ORVs. Segment 1 is recommended for wild river designation, consistent with the existing wilderness. Segments 2 and 4 are recommended for recreational river designation. This designation would provide additional protection for the free-flowing character and ORVs while still allowing for recreational development. Segment 3 is recommended for scenic river designation to allow for limited maintenance on the Arroyo Seco Indians Road and trailheads.

Alternative 5: No segments are recommended for designation.

Alternative 6: Segment 1 is recommended for wild river designation, consistent with the existing wilderness. Segments 2 and 4 are recommended for recreational river designation. This designation would provide additional protection for the free-flowing character and ORVs while still allowing for recreational development. Segment 3 is recommended for scenic river designation to allow for limited maintenance on the Arroyo Seco Indians Road and trailheads. The recommended designations protects and enhances outstandingly remarkable scenery, recreation, geology, and fishery values and features, including species conservation, biodiversity, open space, natural beauty, recreation and research.

Suitability Determination for the Preferred Alternative

Describe the rationale for the suitability determination of the preferred alternative:

Segment 1 is recommended for wild river designation. Segment 2 and 4 are recommended for recreational river designation. Segment 3 recommended for scenic river designation. Recommending segment 1 for wild river designation would be compatible with existing wilderness management. Segment 2 contains the Monterey County Sportsman's Lodge. This organization camp has been under special use permit since the 1920s and is

very popular with local sportsmen. Designation would allow for the perpetuation of this use and would provide a continuous wild and scenic river corridor. Designation of segment 3 as a scenic river within the wilderness would protect outstandingly remarkable values and allow for the continued use and maintenance of the Arroyo Seco – Indians Road. A scenic river designation would allow for continued public access, fire prevention, fire suppression, watershed improvement projects and provide a full range of recreation opportunities. The portion of the Arroyo Seco River corridor downstream from Horse Bridge is the most popular recreation area on the Monterey Ranger District. The high degree of private development in Sections 31 and 6, within the corridor and immediately adjacent to the river, would frustrate Wild and Scenic River management at a high classification; therefore, in order to provide protection for the free-flowing character and ORVs while still allowing for development, recreational designation is recommended.

Indian Creek

Indian Creek Study Area Summary

In November of 1993, the Los Padres National Forest published Amendment No. 2 to the Forest Land and Resource Management Plan identifying Indian Creek for eligibility and suitability evaluation as a potential addition to the National Wild and Scenic River System.

Name of River: Indian Creek

Location: State of California, Santa Barbara County, Los Padres National Forest

For the purposes of this study, Indian Creek was divided into two segments.

Segment 1: Indian Creek is considered to be free flowing below a point in the Dick Smith Wilderness near Bluff Camp (T7N, R26W, Sec 19, SBBM) and then flows in a southerly direction. Segment 1 continues downstream from the source to where Indian Creek leaves the Dick Smith Wilderness in T6N, R26W, Sec 19, SBBM.

Segment 2: Segment 2 goes from the Dick Smith Wilderness boundary to the upstream extent of the Mono Debris Basin in the northeast corner of T5N, R26W, Sec 6, SBBM.

River Mileage:

River Segment	Miles Studied	Miles Eligible
1	9.6	9.6
2	5.1	5.1

Studied: 14.7 miles

Eligible: 14.7 miles

Indian Creek Eligibility Inventory

Determination of Free-flow:

A weir, approximately six feet in height, exists within one-quarter mile of the lower boundary of the study segment. The weir was built in the 1940s and the area behind the weir is completely silted in. Indian Creek above Mono Debris Basin is considered to be free flowing.

Determination of Outstandingly Remarkable Values (ORVs):

1. Scenery

Description: The majority of the Indian Creek corridor is scenic attractiveness class "A" landscape. Scenic attractiveness class "A" landscapes are distinctive within the Southwest Mountain and Valley Character type. Indian Creek is distinctive not only because of the presence of water, but also because of the mix of landform,

color, and vegetation.

From the Bluff camp to Poplar camp, there are steep canyon walls creating a strong sense of enclosure after the first one-quarter mile. Of note is the occasional spruce tree along the corridor. There is also a mix of sage and chaparral cover with distinctive groves of alders. There is the yearlong presence of water and many small pools. The slopes offer a contrast of black and gray shale and vegetated canyon walls. By the time you reach Poplar Camp, you feel that you have really entered down into the creek canyons.

From Poplar camp to Pens camp, the landscape opens up with the strong evidence of oak grassland with the mix of some sycamores. In the stretch from Pens camp to Indian Narrows, the landform gets real narrow with high vertical walls and distinctive caves. The dramatic sheer bare walls and dark sandstone color provides for a vivid contrast as the canyon sweeps into the Narrows. Bigcone Douglas-fir can be seen from the creek.

The Narrows are very distinctive with large limestone formations, smooth polished surfaces, and steep crossings. Pools, rushing water sounds, the narrow channel, and white, luminous, polished rock make the area unique. There are views of the canyon below, including deep pools and many waterfalls.

The distance from Indian Canyon camp to the termini just beyond Mono camp is similar but not nearly as dramatic. The landscape is wider and there is more of a riparian zone with grass and oak grassland. The water is intermittent in this section and the vegetation is more typical of the character type as it empties into a pool at the end.

Determination: Scenic values are not considered to be outstandingly remarkable. Although the scenic values are distinctive landscapes, there are better examples of these scenic features along the designated Wild and Scenic Sisquoc River.

2. Recreation:

Description:From Bluff Camp to Poplar Camp, Indian Creek is perennial and available for public recreational use in a setting with remarkable rock formations, cultural sites, and biodiversity. Indian Creek is popular for hiking. It is unique within California for the mix of cultural and biologically diverse qualities. From Pens Camp, the walls of the sandstone canyon become deeper and narrower. The trail has been abandoned, but hiking access is possible along the creek bottom until the visitor reconnects with Forest Trail 26W08 that begins again at Indian Creek Camp. In the dramatic "Narrows" area, water passes over a luminescent, polished, white sandstone formation creating deep pools and falls, including one spectacular pool area with a waterfall in a setting of large boulders.

The stretch of Indian Creek from Indian Creek Camp begins to show more signs of visitor use. The trail follows along the creek, with some large pools with cattails, finally to reach the intersection with Camuesa Off Highway Vehicle Route (National Forest System Road (NFSR) 5N15) and the Buckhorn/Indian Creek Trailhead.

Indian Creek and the adjacent trail provide opportunities for extended dispersed camping, backpacking, and hiking in a wilderness setting. From the headwaters near Bluff Camp to Lower Buckhorn Camp, the Indian Creek drainage is within the Dick Smith Wilderness. The lower segment of this creek and the Buckhorn Trail is a multi-use trail used by hikers, mountain bicyclists, and equestrians. Fishing for native rainbow trout is a main attraction. Use is estimated to be 500 visitor days per year with approximately 95% of the use coming from Santa Barbara and Ventura Counties. A portion of the remaining 5% includes out of state and international visitors.

Determination: Recreation values are locally significant but not considered to be outstandingly remarkable.

3. Geology

Description: Indian Creek is located in the Coast Ranges of central California. This is a geologically young mountain range that was uplifted to its present height about 400,000 years ago. The range includes Mesozoic age rocks that represent a subduction zone complex (the Franciscan Complex), a magmatic arc (plutonic and metamorphic rocks of the Salinian Block), and forearc basin sediments (the Great Valley Sequence). It also includes younger Tertiary marine sediments and Quaternary largely non-marine sediments.

The headwaters of Indian Creek are in the Cachuma Formation. The creek crosses the Big Pine Fault that deflects the stream as it passes into the Juncal Formation (shale unit). It then crosses a syncline cored by the Monterey Formation. The course of Indian Creek cuts across six mapped northwest trending faults and is nearly perpendicular to numerous fold axes.

Near Narrows Campground in the Big Pine Mountain quad, a band of resistant Sierra Blanca Limestone overlying the Mono Shale member of the Cachuma Formation forms the narrows. Sandstone units from the Juncal and Cachuma Formation and the Sierra Blanca Limestone form the resistant bluffs along the creek.

Determination: The Big Pine Fault is one of California's major left-slip faults. The fault and its related structures provide critical information for a better understanding of the development of the west coast of North America. Much study is occurring to determine the structural activity that defines the relationship of these mountains to the tectonic development of southern and central California, from San Diego to the Central Valley. This is significant at a regional level and is considered to be outstandingly remarkable.

4. Fish and Wildlife

Description: The lower segment of Indian Creek provides habitat typical of southern California third order streams. However, due to its rather pristine nature and its juxtaposition with the Santa Ynez River, it provides for a very unique assemblage of threatened, endangered and sensitive species. These species include: arroyo toad, California red-legged frog, southwestern pond turtle and, and two-striped garter snake. This stream is currently devoid of any exotic aquatic species such as bullfrog, green sunfish, bullhead, bass and flathead minnow, all of which inhabit many of the other similar stream systems on the forest. Habitat exists to support the least Bell's vireo, southwestern willow flycatcher, California condor (one historic nest site in the upper reaches of the drainage), and California spotted owl.

This ecosystem is approximately 15 miles long, providing habitat for wider ranging animals such as mountain lion and black bear, as well as an area for adequate genetic interchange between species that require this ecosystem to breed in.

Indian Creek is home for one of the largest populations of the federally designated endangered arroyo toad *(Bufo californicus)*, on the Los Padres National Forest and includes five miles of federally designated critical habitat for this species.

Portions of Indian Creek also contain federally designated critical habitat for the federally and state listed endangered least Bell's vireo *(Vireo bellii pusillus)*. No recent sightings have been reported on Indian Creek but they have been reported in the adjacent Mono Creek.

Habitat exists within Indian Creek for willow flycatcher *(Empidonax trillii)*, a Forest Service sensitive species.

California red-legged frog *(Rana aurora draytonji)*, a federally listed threatened species, is found in suitable habitat within the Indian Creek drainage. The creek supports five miles of federally designated critical habitat for this species.

Southwestern pond turtle *(Clemmy marmorata pallida)*, a federally listed rare and Forest Service sensitive species, is found in suitable habitat throughout the drainage.

Two-striped garter snake *(Thamnophis hammondii)*, a Forest Service sensitive species is also found scattered throughout the creek corridor.

The upper headwaters of Indian Creek also provide habitat for the California spotted owl *(Strix occidentalis occitentalis)*, a Forest Service sensitive and federally listed rare species, and an historic nest site of the federally endangered California condor *(Gymnogyps californianus)*. Upper reaches of Indian Creek are within federally designated critical habitat for the California condor.

Determination**:** The resident population of arroyo toads in Indian Creek is one of the largest within one hundred miles, and since the geographical range of this meta-population contains gaps, this is outstandingly remarkable. Although the other species mentioned above are outstanding according to their definition as threatened, endangered, or sensitive, the habitat and wildlife resources within Indian Creek drainage are not outstandingly remarkable amongst other drainages with similar habitat and species components (see criterion for habitat and population).

5. Heritage resources (Cultural)

Description: Only very small areas of the upper portion of the corridor have been formally inventoried. The lower end has received somewhat more inventory. Twenty-nine sites are known to be within the corridor; many of these are unrecorded. An additional site is just outside the corridor within the Mono Debris Basin.

At least some of the abundant prehistoric sites probably possess high potential to yield scientific information.

Subsurface testing would be needed to determine their level of significance as compared to other, possibly similar sites.

A Chumash rock art site is present and consists of four or five panels. One of them is very distinctive and was featured in Campbell Grant's The Rock Paintings of the Chumash. This site, given the level of interest in Chumash rock art, has national or international significance, provided that its condition is such that the values as observed in 1976 are still substantially intact. If not, the existence of accurate records means that the site still has potential to supply information regarding element distribution; also, the site may retain interpretive potential.

Determination: The Chumash rock art site is considered to be outstandingly remarkable. The aesthetic values are somewhat dependant upon the condition of the site; however, the recorded information about the site is such that some aesthetic values, interpretive potential, and possibly scientific information value are retained.

6. Heritage resources (Historic)

Description: The historic site components include remnants of the Bluff Camp Guard Station and a limestone mine and may be significant at the local level. Further research would be needed to determine this.

Determination: Though these historic site components may be significant at the local level, historic values are not considered outstandingly remarkable.

7. Other (Botany)

Description: The botanical resources of the Indian Creek are not well known. No systematic effort has been made to inventory the botanical resources found in the study corridor.

Based on a review of existing literature, there are no known occurrences of endangered, threatened, proposed, candidate, or sensitive plant species within one-quarter mile of Indian Creek. There are a number of occurrences of sensitive plant species on the ridge tops of the San Rafael Mountains but these populations all occur more than one mile from the creek.

Determination: Botanical values are not considered to be outstandingly remarkable.

Summary of Outstandingly Remarkable Values:

Geology

The Big Pine faults and the sedimentary rock formations found within Indian Creek include important features crucial to the understanding of the very complex structural and geomorphic evolution of the west coast of North America. Indian Creek cuts through these formations and structures exposing beautiful outcrops and making them accessible for study.

Wildlife

The resident population of arroyo toads in Indian Creek is one of the largest within one hundred miles, and since the geographical range of this meta-population contains gaps, this is outstandingly remarkable.

Cultural

The Chumash rock art site is considered to be outstandingly remarkable.

Potential Classification

See table 438: Indian Creek - Potential Classification by River Segment.

Indian Creek Suitability Report

Description

Landownership and Land Uses

With the exception of part of the quarter mile buffer at the lower end, the Indian Creek corridor is within National Forest System lands. The upper extent of the Mono Debris Basin, owned by the City of Santa Barbara, is immediately below segment 2.

The river mile location is from the source (see table 445: Indian Creek - Segment Description).

Mineral and Energy Resource Activities

There is no known potential for mineral and energy development.

Water Resources Development

A weir, approximately six feet in height, exists within one-quarter mile of the lower boundary of the study segment. The weir was built in the 1940s and the area behind the weir is completely silted in.

Transportation, Facilities and Other Developments

Forest Trail 26W08 (Indian Creek Trail) parallels Indian Creek corridor from Bluff Camp to Pens Camp. The trail has been abandoned south of Pens Camp, but hiking is possible along the bottom of the creek until reconnecting with Forest Trail 26W08 at Indian Creek Camp and continuing south to NFSR 5N15, the Camuesa Off Highway Vehicle Route.

Recreation Activities

Trail 26W08 begins at Bluff Camp and follows Indian Creek to the junction with NFSR 5N15 (an OHV route). Opportunities for extended dispersed camping, backpacking and hiking are available in a wilderness setting on segment 1. Segment 2 is used by a varied group of recreationists including hikers, mountain bicyclists and equestrians. Fishing for native rainbow trout and viewing the dramatic rock formations and waterfalls are the main attractions.

Other Resource Activities

Ridge top fuelbreaks are maintained through vegetation removal and prescribed fire. Trail maintenance is performed on the Forest Service system trails described above to minimize resource damage. The populations and habitats of arroyo toads, red-legged frogs, least Bell's vireo, and southwest willow flycatcher are intensively monitored within the Indian Creek drainage. Vandalism of important cultural sites does occur; these sites are monitored for any damage.

Special Designations

All of segment 1 is in the congressionally designated Dick Smith Wilderness.

Socio-Economic Environment

The Santa Barbara front is the closest urban area and is within eight miles of Indian Creek. The Santa Ynez Valley contains the communities of Buellton, Santa Ynez, Solvang, and Los Olivos. Vehicular access to Indian Creek is limited by seasonal closures and long drive times over low standard roads. Use in the Indian Creek corridor is limited to non-motorized activities. Designation as a Wild and Scenic River would not change the existing use patterns. Existing use would not threaten the outstandingly remarkable values.

Current Administration and Funding Needs if Designated

	Expenses Independent of Designation	Additional Expenses with Designation
General Administration *	**$4,000**	**$33,000**
Development of River Management Plan	**$ 0**	**$150,000**
Development Costs	**$0**	**$10,000**
Operation and Maintenance Costs	**$20,000**	**$5,000**
Total Cost First Five Years	**$24,400**	**$198,000**

*General administration and operation and maintenance costs of designated river are estimated to continue at $5,000 annually.

Suitability Factor Assessment:

1. Characteristics that do or do not make the area a worthy addition to the National System.

Worthy: The resident population of arroyo toads, a federally endangered species, is one of the largest within one hundred miles. Since the geographical range of this meta-population contains gaps, this is outstandingly remarkable. There are also historic condor roosts and nesting in nearby canyons. Designation as a Wild and Scenic River would support efforts to maintain and improve habitat.

Not worthy: The Chumash rock art site is considered to be outstandingly remarkable. Designation as a Wild and Scenic River would add little protection to these resources and may increase vandalism.

2. The current status of land ownership and use in the area.

All of the corridor is in federal ownership and provides wildland recreational opportunities.

3. The reasonable foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed if the area were included in the System.

Indian Creek is within a section of Los Padres National Forest referred to as Mono Basin, which also includes a section of the middle Santa Ynez River, and all of Aqua Caliente and Mono Creeks. Past surveys have shown that the varied habitats in Mono Basin support a rich diversity of species, including several federally threatened and endangered species. For this reason, the area is being considered for a special interest area designation in the revised Los Padres Land and Resource Management Plan, where wildlife research, viewing and interpretation will be emphasized. Designation of Indian Creek as a Wild and Scenic River will not curtail these activities.

4. The federal agency that will administer the area, should it be added to the System.

USDA Forest Service.

5. The extent to which the agency proposes that administration of the river, including the costs thereof, be shared by State and local agencies.

No proposals to share costs with State and local agencies exist.

6. The estimated cost to the United States of acquiring necessary lands and interests in land and of administering the area, should it be added to the system.

No lands to be acquired.

7. A determination of the degree to which the State or its political subdivisions might participate in the preservation and administration of the river, should it be proposed for inclusion in the System.

Not significant to the State or other entities.

8. The consistency of designation with other agency plans, programs or policies.

A consideration in this revision is the creation of the Mono Basin Special Interest Area to highlight the unique assemblage of threatened, endangered, and sensitive species and their habitat. The designation of Indian Creek as a Wild and Scenic River would be consistent with the creation of a special interest area.

Forest Plan Alternatives

Briefly describe how a particular river was treated in each of the Forest Plan alternatives:

Alternative 1: No segments are recommended for designation.

Alternative 2: Segment 1 is recommended for wild river designation, consistent with the existing wilderness. Segment 2 is recommended for scenic river designation. A scenic designation will allow for continued road access and for heritage interpretation. The recommended designations provide the best balance of recreation and scenery values with the need to protect and enhance the free-flowing character, water quality and outstandingly remarkable values.

Alternative 3: Segments 1 and 2 are recommended for wild river designation. Reduce trail access to the corridor. Indian Creek has wildlife an ORV. This recommendation balances the need to protect and enhance the free-flowing character, water quality and outstandingly remarkable wildlife values with the conservation of a wide range of wildlife and plant species (especially TES) and habitats, biodiversity, linkages, and corridors

Alternative 4: No segments are recommended. The ORVs do not include recreation or scenery.

Alternative 5: No segments are recommended.

Alternative 6: Segments 1 and 2 are recommended for wild river designation. No additional development. The recommended designation protects and enhances a wide range of values and features, including species conservation, biodiversity, open space, natural beauty, recreation and research.

Suitability Determination for the Preferred Alternative

Describe the rationale for the suitability determination of the preferred alternative:

Recommend against designation. Segment 1 is already in congressionally designated wilderness and segment 2 is in a wildland setting that is recommended for the Mono Wildlife Special Interest Area.

Little Sur River

Little Sur River Study Area Summary

Name of River: Little Sur River

Location: State of California, Monterey County, Los Padres National Forest

The Little Sur River study area includes both the main stem and the South Fork. The main stem is considered to be free flowing below a point in the Ventana Wilderness northwest of the Ventana Double Cone in the southeastern quarter of T18S, R2E, Sec 34, MDBM. The South Fork is considered to be free flowing below a point within the Ventana Wilderness west of the Ventana Double Cone in the northeast quarter of T19S, R2E, Sec 9, MDBM. The main stem and South Fork flow in a westerly direction to join at the western tip of Dani Ridge in the northwest quarter of T18S, R1E, Sec 34, MDBM. The main stem of the Little Sur River then continues to flow westerly to the Pacific Ocean. For the purposes of this study, the Little Sur River was divided into five segments.

Segment 1: This segment includes the main stem (North Fork) of the Little Sur River from the headwaters to the boundary of the Ventana Wilderness in the northwest corner of T18S, R2E, Sec 32.

Segment 2: This segment originates at the Ventana Wilderness boundary near Jackson Camp and continues to the administrative boundary of the Los Padres National Forest along the western boundary of T18S, R1E, Sec 25, MDBM. Total length is approximately 3.3 miles and only about 1.2 mile of this segment flows within National Forest System lands. This segment also encompasses a 0.5-mile length of the Pico Blanco Boy Scout Camp. In addition to several buildings, the developments include a cement impoundment on the river to create a recreational pond.

Segment 3: This segment originates at the administrative boundary of the Los Padres National Forest along the western boundary of T18S, R1E, Sec 25, MDBM, and ends at the confluence with the South Fork of the Little Sur River. All lands within this study segment are privately owned and outside of the forest boundary.

Segment 4: The South Fork of the Little Sur River from the headwaters to the confluence with the main stem. The total length is approximately 10.4 miles. Roughly 6.5 miles are within the administrative boundary of the Los Padres National Forest and 4 miles are entirely within the Ventana Wilderness and 2 miles border the recent addition. Approximately 1.5 miles are within Andrew Molera State Park.

Segment 5: The main stem of the Little Sur River from the confluence with the South Fork to the Pacific Ocean. All lands within this study segment are privately owned and outside the forest boundary.

River Mileage:

River Segment	Miles Studied	Miles Eligible
1	4.9	4.9
2	3.3	3.3

3	4.2	0.0
4	10.4	0.0
5	2.0	0.0

Studied: 24.8 miles

Eligible: 8.2 miles

Little Sur River Eligibility Inventory

Determination of Free-flow:

The main stem of the Little Sur River has an impoundment associated with the Pico Blanco Boy Scout Camp (T18S, R2E, Sec 30). The impoundment is used to create a recreational pond. No other current impoundments are known to exist. Past impoundments associated with logging and ranching may have existed but are not evident today. The Little Sur River is considered to be free flowing.

Determination of Outstandingly Remarkable Values (ORVs):

1. Scenery

Description: The headwaters of the Little Sur have no evidence of water but offer dramatic views to the ocean on the west and the entire Ventana Wilderness. The vegetation is chaparral, scrub oak and pine along very steep slopes. As the land flattens, water becomes evident and a hardwood canopy creates more enclosure. The river zigzags within this canopy.

At Fox Camp smells change, moss on the rocks, redwoods and ferns mix with alders and sycamores to offer a rich diversity of vegetation. The river is 20 to 25 feet wide with a few scattered boulders, although the vegetation is the main feature.

The vegetation shifts to a mix of oaks and massive redwoods, waterfalls, and landforms of granite and white marble adding color to the landscape. Views of the ocean become more evident.

The land becomes even steeper, with lots of waterfalls among a mix of hardwoods and redwoods as the river flows into Pico Blanco Camp. The feature here is a large waterfall with a 150-foot drop, deep pools and prolific ferns. The vegetation changes to all redwoods as the river widens to 40 feet. The land gets real steep at Little Sur Camp and then opens to a wide valley. Now the river slows with a lush jungle like undergrowth.

As the river enters private land, alders and willows prevail. The valley is broader as the river winds through grassy cattle land. There is a lot more evidence of humans with fences and buildings dominating the landscape.

Determination: Scenic values are not considered to be outstandingly remarkable. Although the scenic values are distinctive landscapes, there are better examples of these scenic features along the designated Wild and Scenic Big Sur River.

2. Recreation

Description: The Little Sur River is on the west slope of the Santa Lucia Mountains. The Little Sur River comprises two branches, the main stem and the South Fork, both of which flow westward to join about two miles from the ocean.

The main stem arises on the northwest slopes of Ventana Double Cone and picks up Puerto Suello, Comings and Skinner Creeks on its north side and Jackson Creek on the south side. The South Fork drains only the south central portion of the watershed.

Relief is pronounced, the upper main stem above Pico Blanco Boy Scout Camp ranging chiefly from 1,000 to 4,800 ft. elevation. The South Fork originates around 4,500 ft. near the west slopes of Ventana Double Cone and drops precipitously to the forks at around 100 ft. elevation. From thence, the river flows on its floodplain west to

the ocean, forming a lagoon at its mouth.

The current uses of the Little Sur River corridor include hiking, backpacking, rock climbing, boys' camps, sunbathing, nature study, bird watching, fishing and hunting. An estimated 70% of the visitors are from Monterey County and an additional 20% are from surrounding counties within a 150-mile radius.

Determination: Recreation values are not considered to be outstandingly remarkable.

3. Geology

Description: The Monterey District of the Los Padres National Forest is in the southern Coast Ranges of California. This is a geologically young mountain range that was uplifted to its present height about 400,000 years ago. The range includes Mesozoic age rocks that represent a subduction zone complex (the Franciscan Complex), a magmatic arc (plutonic and metamorphic rocks of the Salinian Block) and forearc basin sediments (the Great Valley Sequence). It also includes younger Tertiary marine sediments and Quaternary largely non-marine sediments. The majority of the Monterey District is part of the Salinian Block. The Arroyo Seco, Carmel, Little Sur and San Antonio Rivers, and Tassajara Creek primarily flow through the basement rocks of this block.

The Little Sur River flows first through northwest trending bands of steeply dipping metasedimentary rocks (schist) and some granitic intrusive rocks. Some of these bands are separated by faults. Several landslides are adjacent to the river where it passes through the metasedimentary rocks. In the vicinity of the Pico Blanco Boy Scout Camp, the Palo Colorado Fault controls the river. This fault is likely responsible for the well known feature called Botcher's Gap, that from the topography map should be visible from the river. At Old Coast Road the river crosses the Sierra Hill Fault and Sur Thrust. Between these two faults are Cretaceous unnamed marine sedimentary rocks. West of the Sur Thrust, the river flows through the Franciscan Complex and overlying folded Tertiary marine sediments. Near the mouth of the river there is a band of serpentine, a rock type that is derived from a deep source and has distinct tectonic implications with regard to the evolution of California's coast.

The Salinian Block is unique because it is appears to have been displaced 200 kilometers northwestward along the San Andreas Fault from its original position between the Sierra Nevada and the Peninsular Ranges. Rocks in the Salinian Block have been structurally deformed by en echelon faults and folds as a result of transform (strikeslip) faulting. The Salinian Block also has anomalous seismic properties that show in a marked decrease in seismic amplitudes. One possible explanation is that the Franciscan Complex underlies the block. The Salinian Block is significant at the central and southern California geographic level.

The Sur Thrust marks the boundary between the Salinian Block and the Franciscan Complex and is thus a major structural feature. The Sur Thrust is significant at the central and southern California geographic level.

The band of serpentine near the mouth of the river is significant at a regional level with regard to the tectonic evolution of the Coast Ranges.

Determination: The Salinian Block metasedimentary and plutonic rocks and the Sur Thrust exposed by the Little Sur River are not considered to be outstandingly remarkable in comparison with similar features located along the designated Wild and Scenic Big Sur River and elsewhere in this geologic province.

4. Fish and Wildlife

Description: The Little Sur River watershed drains west to the Pacific from a large, bowl shaped watershed on the coast range. Riparian vegetation along this river consists of alder and willows species growing intermittently among redwoods and riparian hardwoods. The river mouth supports one of the more extensive willow thickets in Big Sur. The north-facing slopes and riparian areas of the Little Sur support a magnificent redwood forest.

A pair of spotted owls (*Strix occidentalis occidentalis*), which are a Forest Service sensitive species, were found in 1990 off National Forest System lands near the Pico Blanco Boy Scout camp.

The Little Sur River is considered an anadromous stream and supports the California South-Central Steelhead evolutionary significant unit, (*Oncorhynchus mykiss*), a federally threatened species. Approximately six miles of steelhead waters within the Little Sur drainage exist on the Los Padres National Forest. This habitat is within the Ventana Wilderness and is nearly pristine.

Determination: Although the above mentioned species are outstanding according to their definition as threatened, endangered, or sensitive, the habitat and wildlife resources within Little Sur River drainage are not considered to be outstandingly remarkable amongst other drainages with similar TES habitat and species components.

5. Heritage resources (Cultural)

Description: Generally speaking, cultural resources along the Little Sur River are poorly known. Much of the river passes through private property, and a substantial portion has not been inventoried for cultural resources. Known prehistoric sites within the studied portion of the river corridor include middens and, in one case, bedrock mortars. Since none of the middens have been formally documented, their potential significance is unknown, and it has not been determined whether the mortar has any other prehistoric materials associated with it.

Determination: Based upon the limited currently available information, prehistoric resources would not be considered outstandingly remarkable. The prehistoric sites need further investigation, including formal recording, before any determinations of significance are possible. One or more of these sites could be significant at the local or regional level.

6. Heritage resources (Historic)

Description: Historic sites within the applicable portion of the river corridor include remains of the Serrano Horse Ranch, which has never been formally documented, a site consisting of "cabin ruins," and the Duvenex Cabins (a group of redwood cabins associated with various artifacts and features). Further research would be needed to determine the level of significance of any of these historic sites, although an educated guess would be that they are significant at the local level.

Determination: Based upon the limited currently available information, historic resources would not be considered outstandingly remarkable. Further research would be needed to determine the significance of the historic sites—one or more could be locally significant.

7. Other (Botany)

Description: Riparian vegetation consists of alder and various species of willow as well as small to large groves of coastal redwood.

Dudley's lousewort (*Pedicularis dudleyi*), a Forest Service sensitive plant species, occurs at scattered locations along the main stem of the Little Sur River for a distance of about 4 miles. These known populations occur west of the administrative boundary of the Los Padres National Forest eastward to the confluence with Jackson Creek. About 1,100 plants are estimated to occur within one-quarter mile of the river based on records from the 1980s. No recent or systematic efforts have been made to determine the exact distribution and abundance of this species in the watershed.

Dudley's lousewort is found in undisturbed redwood forests canyons, sometimes on slightly disturbed locations, and in loose soil. Dudley's lousewort is listed as Rare by the State of California and is listed by the California Native Plant Society (2001) as 1B (plants rare, threatened, or endangered in California and elsewhere). Trampling by hikers and equestrians, and trail maintenance has been identified as threats to the plants found in the Little Sur River watershed.

This population is considered special at the scale of the central coastal region of California and at the Forest scale. Other populations of Dudley's lousewort are found in San Luis Obispo County, Santa Cruz County, and San Mateo County. Statewide, there are fewer than 10 known locations for this species.

Determination: Dudley's lousewort is an outstandingly remarkable botanical value due to its local dependence on redwood forests and associated riparian habitat. The population of Dudley's lousewort found in the Little Sur River is not unique; however, the cluster of colonies present in the watershed collectively constitute the largest known population and together there are more plants here than in all the other populations combined. Due to the fact that Dudley's lousewort is found only on the central coast of California and nowhere else in the world and given that the largest and most robust population is found on the Little Sur River.

Summary of Outstandingly Remarkable Values:

Botany

The cluster of colonies of Dudley's lousewort found on the main stem of the Little Sur River collectively constitute the largest known population found anywhere in the world.

Potential Classification

See table 439: Little Sur River - Potential Classification by River Segment.

Little Sur River Suitability Report

Description

Landownership and Land Uses

Segment 1: This segment includes the main stem of the Little Sur River from the headwaters to the boundary of the Ventana Wilderness in the west one-half of T18S, R2E, Sec 31. The total length is approximately 4.9 miles.

Segment 2: This segment originates at the Ventana Wilderness boundary at the boundary with private land in Section 31 and continues to the administrative boundary of the Los Padres National Forest along the western boundary of T18S, R1E, Sec 25. The 3.3-mile total length is composed of about 1.2 miles of National Forest System (NFS) land and 2.1 miles on private lands. The forest segment also encompasses a 0.5-mile length of the Pico Blanco Boy Scout Camp. In addition to several buildings, the developments include a cement impoundment on the river to create a recreational pond.

All private lands within these river segments are designated in the Monterey County General Plan as “Rural”. These lands are zoned primarily for grazing and very low-density residential housing.

The river mile location is from the source (see table 446: Little Sur River - Segment Description).

Mineral and Energy Resource Activities

Granite Rock Corporation has a perfected claim and plans to develop the limestone deposits on Pico Blanco. During public meetings for the Los Padres Land and Resource Management Plan Revision, representatives of Grant Rock emphasized that the company still intends to develop this claim. The timing of this development is unknown.

Water Resources Development

The Pico Blanco Boy Scout Camp has a cement impoundment on the river to create a recreational pond within segment 2. There are no known Federal Energy Regulatory Commission applications or permits.

Transportation, Facilities and Other Developments

Recreation facilities in the river area are:

Jackson Camp primitive campsite within Ventana Wilderness near western boundary of the wilderness.

Little Sur primitive campsite, Section 25, T18S, R2E, outside of wilderness.

Trail access crosses one parcel of NFS land surrounded by private land to Pico Blanco camp.

One mile of the Little Sur Trail (1E03) from Pico Blanco to the primitive Jackson Camp within the Ventana Wilderness.

Trail from road to Little Sur primitive campsite and river.

A road parallels the river through non-federal land for approximately one mile before terminating at Pico Blanco camp.

Several buildings and structures are associated with Pico Blanco Boy Scout Camp in segment 2.

A locked gate prohibits access to the private land outside of the Ventana Wilderness and restricts vehicular access to the Little Sur River. Trail access from the south side of the river requires about 6 miles of hiking from the Old Coast Road outside of the forest boundary.

Recreation Activities

Current uses include hiking, backpacking, rock climbing, boys’ camps, sunbathing, nature study, bird watching, fishing and hunting.

Other Resource Activities

There is grazing on private land in segment 1. Timber harvesting may occur on private land in segment 2. Prescribed burning is planned along road and trail corridors to protect existing developments from wildfire.

Special Designations

Segment 1 is within the Ventana Wilderness.

Socio-Economic Environment

Big Sur is an unincorporated area of Monterey County with dispersed rural housing and communities. Monterey is approximately 20 miles north from the mouth of the river. Real estate values are high in this area and economic development is primarily limited to tourism. This is an international destination to visitors with renowned scenery. Designation as a Wild and Scenic River would have a negligible impact on the local economy. Recreation use patterns would not be affected.

Current Administration and Funding Needs if Designated

The USDA Forest Service administers all NFS land. The Little Sur Protected Waterways Management Plan, which is part of the Monterey County Local Coastal Program, protects that portion of the river on private or State land.

	Expenses Independent of Designation	Additional Expenses with Designation
General Administration *	**$2,050**	**$31,950**
Development of River Management Plan	**$0**	**$150,000**
Development Costs	**$0**	**$5,000**
Operation and Maintenance Costs	**$10,250**	**$4,750**
Total Cost First Five Years	**$12,300**	**$191,700**

* General administration and operation and maintenance costs are estimated to continue at $3,000 annually.

Suitability Factor Assessment:

1. Characteristics that do or do not make the area a worthy addition to the National System.

Not worthy: Botany is the only outstandingly remarkable value for the Little Sur River. Dudley's lousewort (*Pedicularis dudleyi*), a Forest Service sensitive plant species, occurs at scattered locations along the main stem of the Little Sur River for a distance of about four miles. Dudley's lousewort is also found in other locations including San Luis Obispo County and is currently protected through Forest Service sensitive species guidelines.

2. The current status of land ownership and use in the area.

Granite Rock Company owns a mining claim on Pico Blanco Mountain. This claim contains a limestone deposit that is the largest mass of chemical quality, uniform grade white-grinding limestone in the western United States. Granite Rock Company fully intends to mine this deposit.

The local Boy Scout Council owns Pico Blanco Boy Scout Camp. The camp is used year-round; however, the primary use season is during the summer. There are several structures within the river corridor. A seasonal impoundment is used during the summer months to create a swimming hole.

3. The reasonable foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed if the area were included in the System.

There are no current proposals for water development. Voluntary compliance with the Wild and Scenic Rivers Act would be emphasized with private landowners within the river corridor.

4. The federal agency that will administer the area, should it be added to the System.

USDA Forest Service.

5. The extent to which the agency proposes that administration of the river, including the costs thereof, be shared by State and local agencies.

No proposal to share costs exists.

6. The estimated cost to the United States of acquiring necessary lands and interests in land and of administering the area, should it be added to the system.

The costs of acquiring private land within the corridor are estimated to be several million dollars. Acquisition of private land would be on a willing seller basis only.

7. A determination of the degree to which the State or its political subdivisions might participate in the preservation and administration of the river, should it be proposed for inclusion in the System.

Participation is unexpected.

8. State and/or Local government's ability to manage and protect the outstandingly remarkable values on non-federal lands.

Private land within the river corridor in segment 2 is currently managed under the Little Sur River Protected Waterway Management Plan.

9. Support or opposition to designation.

In a letter dated April 15, 1994, attorneys representing Mr. James Hill III of the El Sur Ranch note that they oppose candidacy for Wild and Scenic River status based on already existing protection via the Little Sur River Protected Waterway Management Plan; roads, houses and other improvements which border with the north and south forks of the river as well as the main body of the river; and on concern that designation would result in increase of human visitation in the remote areas of the Ranch or in activities which might create a potential for increasing trespass on the Ranch property.

10. Contribution to river system or basin integrity.

The length of the river within the Ventana Wilderness boundary is already protected by designation as wilderness.

Forest Plan Alternatives

Briefly describe how a particular river was treated in each of the Forest Plan alternatives:

Alternative 1: No designation is recommended for either segment.

Alternative 2: No designation is recommended for either segment. The only identified ORV is botany. Designation would not promote a balance between recreation and scenery values with the need to protect botanical values.

Alternative 3: Segment 1 is recommended for wild river designation, consistent with the existing wilderness. Segment 2 is recommended for recreation river designation due to the presence of roads and developments on private land. The North Fork of the Little Sur River has botany as an ORV. The recommended designation balances the need to protect and enhance the free-flowing character, water quality and outstandingly remarkable botanical values with the conservation of a wide range of wildlife and plant species (especially TES) and habitats, biodiversity, linkages and corridors.

Alternative 4: No designation recommended for either segment. The ORVs do not include recreation or scenery.

Alternative 5: No designation recommended for either segment.

Alternative 6: Segment 1 is recommended for wild river designation, consistent with the existing wilderness. Segment 2 is recommended for recreation river designation due to the presence of roads and developments on private land. The recommended designation protects and enhances a wide range of values and features, including species conservation, biodiversity, open space, natural beauty, recreation and research.

Suitability Determination for the Preferred Alternative

Describe the rationale for the suitability determination of the preferred alternative:

Neither segment 1 or 2 is recommended for designation. The outstandingly remarkable value (ORV) for the river is a sensitive plant species. The NFS land in segment 1 is designated as wilderness and this designation protects

the area from impacts from human use of the wilderness. This should be adequate protection for this plant. The plant can be monitored and if change in populations or habitat are occurring, then appropriate measures can be taken to protect the plant.

The ORV can be protected on NFS lands in segment 2 in the same manner. On private land, protection would be done under the existing Little Sur River Protected Waterway Management Plan.

Mono Creek

Mono Creek Study Area Summary

In November of 1993, the Los Padres National Forest published Amendment No. 2 to the Forest Land and Resource Management Plan identifying Mono Creek for eligibility and suitability evaluation as a potential addition to the National Wild and Scenic River System.

Name of River: Mono Creek

Location: State of California, Santa Barbara County, Los Padres National Forest

Mono Creek is considered to be free flowing below a point in the Dick Smith Wilderness in Don Victor Canyon within the southeastern corner of T7N, R26W, Sec 1, SBBM) and then flows in a generally southern direction. For the purposes of this study, Mono Creek was divided into two segments.

Segment 1: Segment 1 continues downstream from the source to where Mono Creek leaves the Dick Smith Wilderness in Township 7 N., Range 25 W., Section 28, SBBM.

Segment 2: From the Dick Smith Wilderness boundary to the upper extent of the Mono Debris Basin in the northeast corner of Township 5 N., Range 26 W., Section 5, SBBM. Private lands encompass approximately one-half mile of segment 2.

River Mileage:

River Segment	Miles Studied	Miles Eligible
1	4.5	4.5
2	19.7	19.7

Studied: 24.2 miles

Eligible: 24.2 miles

Mono Creek Eligibility Inventory

Determination of Free-flow:

Mono Creek has neither past or current diversions nor impoundments above Mono Debris Basin.

Determination of Outstandingly Remarkable Values (ORVs):

1. Scenery

Description: The length of Mono Creek offers a mixture of scenic attractiveness class "A" and "B" landscapes. Scenic attractiveness class "A" landscapes are distinctive within the Southwest Mountain and Valley Character type. Mono Creek is partially distinctive not only because of the presence of water, but also because of the mix of landform, color and vegetation.

From the headwaters to Don Victor Valley, the water is intermittent with the landforms showing some color

contrasts with the shale and sandstone. The vegetation includes some bigcone Douglas-fir on the north slopes but overall is a scenic attractiveness class "B" landscape. At Don Victor, the landscape opens with grass, juniper, and rabbit brush dominating the vegetation types. This area has the feel of the high dessert. The water meanders through the length.

Through the confluence with Roblar Canyon to the Narrows, chaparral, oaks, some willows, and sycamores dominate with small pools of water and a still intermittent stream. At the Narrows, the landform is extremely steep with sandstone benches offering dramatic color contrasts. There are large deep pools, slides, and small waterfalls. The area features very narrow canyons, big rocks, and water from wall to wall. Access through this section is only by swimming the watercourse. The creek winds its way through the rock, with scenery including bigcone Douglas-fir in the side canyons, many bare rock slopes, and 10 to 15 foot waterfalls. This area is seldom visited because of the limited access.

At Ogilvy Ranch, there are terraces with a grass savannah look and only intermittent water. This area has a narrow riparian belt with chaparral dominating the vegetation. This section offers views of Hildreth Peak and other vistas. South of Ogilvy Ranch, the landscape opens even more with deep pools and cattails. A concrete crossing is evident where Mono Creek reaches Camuesa Road (National Forest System Road (NFSR) 5N15) and the impacts of humans become more noticeable resulting in class"B" landscape.

Determination: Scenic values are not considered to be outstandingly remarkable. Although there are some distinctive landscapes, there are better examples of these scenic features along the designated Wild and Scenic Sisquoc River.

2. Recreation:

Description: From the headwaters through Don Victor Canyon, flows are intermittent with limited recreational opportunities. Only partially accessible by primitive trail, the deep canyon offers no vistas.

On entering valley between Don Victor Canyon and the Narrows, vistas open to oak-savannah flats with some desert characteristics. Water flows are intermittent and underground most of year providing little recreation opportunity. A little used primitive trail follows Mono Creek downstream from Roblar Canyon.

At the Narrows, Mono Creek is dramatic and provides a unique recreation opportunity with large, deep pools, sandstone benches, large rock formations, and waterfalls. Bigcone Douglas-fir in side canyons adds to the uniqueness. Swimming is the only access. A primitive trail along the bottom intersects the Mono/Alamar Trail (Forest Trail 26W07). The unique character of rocky, isolated canyons with sandstone formations and deep pools in dramatic settings.

Below the privately owned Ogilvy Ranch, the trail turns into abandoned jeepway. There are many deep pools available for swimming lined by sandy beaches with cattails. Vistas of Hildreth Peak and San Rafael Range are available.

Ogilvy Ranch is a developed homestead with multiple structures, orchards, and an airstrip. This area is more accessible to the average hiker and to shorter equestrians rides of one to three days. Cottonwoods and willows form a unique riparian forest, which offers visitors an opportunity to experience a diverse ecosystem with views of wilderness backcountry.

Although Mono Creek does provide many of the same dispersed and wilderness recreational opportunities as the adjacent Indian Creek drainage, foot, hoof, and wheel access is not heavily apparent because of reduced trail access. Recent abandonment of portions of the Victor/Loma jeepway (NFSR 7N05) in the lower reaches on Mono Creek and to the north in Don Victor Valley has greatly reduced public access. Use is estimated to be 150 visitor days per year with approximately 95% of the use coming from Santa Barbara and Ventura Counties. A portion of the remaining 5% includes out of state and international visitors.

Determination: Recreation values are not considered to be outstandingly remarkable.

3. Geology

Description: Mono Creek is located in the Coast Ranges of central California. This is a geologically young mountain range that was uplifted to its present height about 400,000 years ago. The range includes Mesozoic age rocks that represent a subduction zone complex (the Franciscan Complex), a magmatic arc (plutonic and metamorphic rocks of the Salinian Block), and forearc basin sediments (the Great Valley Sequence). It also

includes younger Tertiary marine sediments and Quaternary largely non-marine sediments.

The trend of upper Mono Creek is subparallel to the fold axis of a syncline. As the creek flows south, it crosses the Big Pine Fault and flows through the Matilija Sandstone and Cozy Dell Shale. Mono Creek primarily follows the outcrop pattern of the Matilija Sandstone as it bends around the nose of an anticlinal fold. It follows a westerly trend as it goes through more shale units and then takes a more southwesterly bend as it begins to encounter more resistant sandstone units that are interbedded with the shale. Towards the lower end of its reach, Mono Creek flows almost perpendicular through more anticlinal and synclinal folds involving the Monterey, Espada, and Cachuma Formations. Landslides occur adjacent to the stream in the Espada Formation.

Determination: The sedimentary rock formations and structural features of the Coast Ranges found in the Mono Creek drainage are not considered to be outstandingly remarkable in comparison with similar features located elsewhere in this geologic province, particularly Indian Creek.

4. Fish and Wildlife

Description: The Mono Creek study area provides habitat typical of southern California third order streams; however, due to its rather pristine nature and its juxtaposition with the Santa Ynez River, it provides for a very unique assemblage of threatened, endangered, and sensitive species. With the exception of a small and marginal population of bullfrog (a few individuals), the section upstream of the Mono Debris Dam is currently devoid of exotic aquatic species such as green sunfish, small-mouth bass and flathead minnow. These and many other exotic fishes inhabit many other similar stream systems on the forest. This stream has received unacceptable impacts from off highway vehicle trespass associated with an access road leading to private property in Mono Creek. This access road, with over 18 stream crossings, has been abandoned as an access route due to its impacts on the arroyo toad, federally listed as endangered; California red-legged frog, threatened; southwestern pond turtle, state listed rare and Forest Service sensitive; and two-striped garter snake, Forest Service sensitive. Habitat also exists to support the federally listed as endangered least Bell's vireo and southwest willow flycatcher. The upper headwaters area of Mono Creek also provide habitat for the California spotted owl and an historic nest site of the California condor.

This ecosystem is approximately 12 miles long, providing habitat for wide ranging animals (large territories) such as mountain lion and black bear. The area also provides for adequate genetic interchange between species that require this ecosystem for reproductive purposes.

The Mono Creek study area provides habitat for a highly diverse assemblage of aquatic and riparian species, which make this one of the most unique streams in southern California. Because Mono Debris Dam acts essentially as a barrier to upstream fish movement, the section above can be considered a refugium for native fishes and to some extend amphibians. There are very few streams on the Los Padres National Forest that share this feature.

Mono Creek is home for one of the largest populations of arroyo toad, *(Bufo californicus)*, a federally listed endangered species, on the Los Padres National Forest and the largest in the northern half if its range in southern California and Baja California. The creek includes nine miles of federally designated critical habitat for the species.

Portions of Mono Creek contain two miles of federally designated critical habitat for least Bell's vireo *(Vireo bellii pusillus)*, a federally and state listed endangered species. About three-quarter of a mile of habitat exists above the debris dam within the study area. The remaining 1.25 miles are along Mono Creek below the dam and are outside the study area. The vireo is known to nest in the critical habitat below the debris dam. In addition, there are recent reports of southwestern willow flycatcher *(Empidonax traillii extimus)*, a federal and state listed endangered species in the same area during late spring, which suggests the possibility of nesting.

Suitable habitat for least Bell's vireo and southwestern willow flycatcher, consisting of large patches of mature willow/cottonwood riparian with relatively dense understory shrub/willow components, is rare along the rivers of the four southern California National Forests. Known nesting populations are small and widely separated. There are patches of suitable habitat for both species scattered for about one mile above the debris dam and for about one mile below. This two-mile segment encompasses the critical habitat for the vireo mentioned earlier. Although vireos are not yet known to nest in the study segment of Mono Creek, there is a reasonable expectation that future surveys will find nest sites. The largest known nesting population of vireo on the Los Padres National Forest and north of San Diego County is located along Mono Creek and the Santa Ynez River below the Mono

Debris Basin. It is also reasonable to expect surveys will confirm nesting by the flycatcher in this area. If nesting by the vireo is confirmed in the study segment, the newly discovered territories can be considered an expansion of the current known nesting population, and the discovery of nesting flycatchers in the segment would represent only the third such occurrence on the Forest.

California red-legged frog *(Rana aurora draytonji)*, a federally listed threatened species, is found in suitable habitat along the entire length Mono Creek. Mono Creek includes six miles of federally designated critical habitat for this species. Southwestern pond turtle *(Clemmy marmorata pallida)*, a state listed rare and Forest Service sensitive species, and two-striped garter snake *(Thamnophis hammondii)*, a Forest Service sensitive species are found in suitable habitat throughout the drainage.

The upper headwaters area of the Mono Creek watershed provides habitat for the California spotted owl *(Strix occidentalis occitentali)*, a Forest Service sensitive and State listed rare species, and a historic nest site of the endangered California condor, *(Gymnogyps californianus)*, exists on one of the large cliff faces that frame the upper terminal basin of the watershed. The upper reaches of the Mono Creek watershed are within federally designated critical habitat for the California condor.

Determination: The study segment of Mono Creek supports a number of unique biotic features. When considered together they represent an outstandingly remarkable value. These features include: the presence of a relatively high number of secure populations of threatened, endangered, and sensitive species; a population of endangered arroyo toads; evidence that two species of endangered birds probably nest; lack of exotic aquatic species; and largely unaltered riparian and aquatic habitats along with the high species diversity they support.

5. Heritage resources (Cultural)

Description: No inventory has been completed at the headwaters; further down, some inventory of the upper end of the corridor has been completed. At the lower end, much of the length of the corridor has been inventoried across a portion of its width.

The prehistoric sites are abundant, and subsurface testing might well demonstrate that some of them possess a high potential to yield scientific information. One site includes flaked stone, shell, burned bone, and shell beads. In addition, this location may correspond with one in which a sweathouse and mound were once recorded, implying that features may be present to yield further information. Also, this site is thought to be at least a part of the historic Chumash village of *Sehuaya*, suggesting that the site can yield information regarding the ethnographic period. A cemetery of unstated age has also been reported for the site or the general area, but whether one is present at the site itself (or possibly another part of *Sehuaya* or *Siwaya*) is not clear. This question needs further investigation.

Another site possesses a large number of manos in what appear to be clusters. This site may have an unusually high potential to yield information regarding processing of raw materials.

A prehistoric Chumash campsite may also be present.

Determination: Cultural values are not considered to be outstandingly remarkable.

Future research may well demonstrate that several of the sites within this study area have unusually high potential to offer scientific information. In addition, possible connections between sites in the study area and certain sites that are outside the study area (closer to the confluence with the Santa Ynez) need further investigation. In combination with the sites outside the study area, the broader area offers unusual characteristics that may pertain to the social, political, and religious organization of the ancestral Chumash. Unfortunately, the information currently available is insufficient to allow one to identify any outstandingly remarkable values within the study area proper.

6. Heritage resources (Historic)

Description: The Ogilvy Ranch Historic Adobe and/or Jones Adobe site has perhaps lost much of its integrity, given that a 1979 discussion states that the Jones Adobe has been dismantled. However, further recording would be needed to assess the significance of the adobe site or sites. Another location in our records likely has no physical remains on the landscape, but is the location where Ramon Ortega was killed when he and his horse fell off a trail in about 1914.

Determination: Historic values are not considered to be outstandingly remarkable.

7. Other (Botany)

Description: The botanical resources of the Mono Creek are poorly known to the rough terrain and isolation of this study river segment. Riparian vegetation consists of various species of willow and oak. Based on a review of existing literature, there are no known occurrences of endangered, threatened, proposed, candidate, or sensitive plant species within one-quarter mile of Mono Creek.

Determination: Botanical values are not considered to be outstandingly remarkable.

Summary of Outstandingly Remarkable Values:

Wildlife

The presence of a relatively high number of secure populations of threatened, endangered, and sensitive species; a population of endangered arroyo toads; evidence that two species of endangered birds probably nest; lack of exotic aquatic species; and largely unaltered riparian and aquatic habitats along with the high species diversity they support.

Potential Classification

See table 440: Mono Creek - Potential Classification by River Segment.

Mono Creek Suitability Report

Description

Landownership and Land Uses

There are approximately 146 acres in private ownership within the corridor of Mono Creek in T6N, R26W, Sec 22. This parcel is locally known as the Ogilvy Ranch. It is occasionally used for private recreational purposes. The lower reach of Mono Creek flows over a debris dam owned by the City of Santa Barbara prior to emptying into the Santa Ynez River. The remainder of the corridor is in federal ownership.

River mile location is from the source (see table 447: Mono Creek - Segment Description).

Mineral and Energy Resource Activities

There is no known potential for mineral and energy development.

Water Resources Development

There are no known plans for hydroelectric or other water development.

Transportation, Facilities and Other Developments

Forest Trail 25W03 parallels the Mono Creek corridor in segment 1 (Don Victor Canyon). This trail is not currently maintained. Trail 26W07 (Mono/Alamar) parallels the southern portion of segment 2 to Ogilvy Ranch. At Ogilvy Ranch, the trail becomes an abandoned jeepway that joins NFSR 5N15 near Mono Campground.

Recreation Activities

Minimal recreational opportunities exist because of limited and primitive access. There is a swimming hole at the Narrows, accessed by a primitive trail that connects to the Mono/Alamar Trail (Forest Trail 26W07). The Mono/Alamar Trail becomes an abandoned jeep way below Ogilvy Ranch and south to NFSR 5N15. The jeepway is used for access to the Ogilvy Ranch.

Other Resource Activities

The abandoned jeepway between Ogilvy Ranch and NFSR 5N15 is used by the landowner for access and by the Forest Service for administrative needs. The property owner way maintains the travel annually. Ridge top fuelbreaks are maintained through vegetation removal and prescribed fire. Trail maintenance is performed on the Forest Service system trails described above to minimize resource damage. The populations and habitats of arroyo toads, red-legged frogs, least Bell’s vireo, and southwest willow flycatcher are intensively monitored within the Indian Creek drainage.

Special Designations

The headwaters and all of segment 1 of Mono Creek are in the congressionally designated Dick Smith Wilderness.

Socio-Economic Environment

The Santa Barbara front is the closest urban area is within eight miles of Mono Creek. The Santa Ynez Valley contains the communities of Buellton, Santa Ynez, Solvang, and Los Olivos. Vehicular access to Mono Creek is limited by seasonal closures and long drive times over low standard roads. Use in the Mono Creek corridor is limited to non-motorized activities. The landowner occasionally accesses the Ogilvy Ranch. Designation as a Wild and Scenic River would not change the existing use patterns. Existing use would not threaten the outstandingly remarkable values.

Current Administration and Funding Needs if Designated

	Expenses Independent of Designation	Additional Expenses with Designation
General Administration *	**$3000**	**$31,000**
Development of River Management Plan	**$0**	**$150,000**
Development Costs	**$0**	**$0**
Operation and Maintenance Costs	**$15,000**	**$5,000**
Total Cost First Five Years	**$18,000**	**$186,000**

*General administration and operation and maintenance costs of designated river are estimated to continue at $4,000 annually.

Suitability Factor Assessment:

1. Characteristics that do or do not make the area a worthy addition to the National System.

Worthy: Even without considering the pristine nature of the river corridor, the presence of a number of secure populations of federally threatened, endangered, and sensitive wildlife including the California red-legged frog and arroyo toad, and evidence that two species of endangered birds (least Bell's vireo and southwestern willow flycatcher) might nest here are important. However, the most remarkable feature of Mono Creek is these populations are especially secure because the habitats are mostly unaltered and there is a general lack of exotic aquatic competitor species, which are known to adversely affect populations of native wildlife. Designation would as a Wild and Scenic River would support efforts to maintain and improve habitat.

2. The current status of land ownership and use in the area.

The Ogilvy Ranch Historic Adobe with additional outbuildings is on a private inholding. This Ranch is an occasional recreational retreat for its owners. There are 146 acres of the Mono Creek corridor on private land.

3. The reasonable foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed if the area were included in the System.

Mono Creek is within a section of Los Padres National Forest referred to as Mono Basin, which includes a section of the middle Santa Ynez River and all of Indian and Aqua Caliente Creeks. Past surveys have shown that the varied habitats in Mono Basin support an unusually rich diversity of species, several of which are federally protected. For this reason, Mono Basin is being considered for a special interest area designation in the revised Los Padres Land and Resource Management Plan, where wildlife research, viewing and interpretation would be emphasized. Designation of Mono Creek as Scenic or Wild would not curtail these activities.

4. The federal agency that will administer the area, should it be added to the System.

USDA Forest Service.

5. The extent to which the agency proposes that administration of the river, including the costs thereof, be

shared by State and local agencies.

No proposals to share costs with State and local agencies exist.

6. The estimated cost to the United States of acquiring necessary lands and interests in land and of administering the area, should it be added to the system.

The Ogilvy Ranch has been listed for sale at a price that exceeds $1,000,000 and has not yet sold. The Forest Service has the authority to purchase at fair market value and that value has not been established.

7. A determination of the degree to which the State or its political subdivisions might participate in the preservation and administration of the river, should it be proposed for inclusion in the System.

Not significant to the State or other entities.

8. The consistency of designation with other agency plans, programs or policies.

A consideration in this revision is the creation of the Mono Basin Special Interest Area to highlight the unique assemblage of threatened, endangered, and sensitive species and their habitat. The designation of Mono Creek as a Wild and Scenic River would be consistent with the creation of a special interest area.

Forest Plan Alternatives

Briefly describe how a particular river was treated in each of the Forest Plan alternatives:

Alternative 1: No segments are recommended for designation.

Alternative 2: Segments 1 and the portion of segment 2 above Ogilvy Ranch are recommended for wild river designation. The portion including and below Ogilvy Ranch is recommended for scenic designation. Administrative jeep trails from P-Bar to and across Mono Creek (6N17, 6N30, 6N24) provide access to Ogilvy Ranch and on the boundary of the Dick Smith Wilderness. A scenic designation would allow for continued road and trail maintenance and access, and for heritage interpretation. This recommended designation provides the best balance of recreation and scenery values with the need to protect and enhance the free-flowing character, water quality and outstandingly remarkable values.

Alternative 3: Segments 1 and the portion of segment 2 above Ogilvy Ranch are recommended for wild river designation. The portion below and including Ogilvy Ranch is recommended for scenic designation. Administrative jeep trails from P-Bar to and across Mono Creek (6N17, 6N30, 6N24) provide access to Ogilvy Ranch and on the boundary of the Dick Smith Wilderness. A scenic designation would allow for continued road and trail maintenance and access, and for heritage interpretation. The recommended designation balances the need to protect and enhance the free-flowing character, water quality and outstandingly remarkable values with the conservation of a wide range of wildlife and plant species (especially TES) and habitats, biodiversity, linkages and corridors.

Alternative 4: No segments are recommended for designation. The ORVs do not include recreation or scenery.

Alternative 5: No segments are recommended for designation.

Alternative 6: Segments 1 and the portion of segment 2 above Ogilvy Ranch are recommended for wild river designation. The portion below and including Ogilvy Ranch is recommended for scenic designation. Administrative jeep trails from P-Bar to and across Mono Creek (6N17, 6N30, 6N24) provide access to Ogilvy Ranch and on the boundary of the Dick Smith Wilderness. A scenic designation would allow for continued road and trail maintenance and access, and for heritage interpretation. The recommended designation would protect and enhance a wide range of values and features, including species conservation, biodiversity, open space, natural beauty, recreation, and research.

Suitability Determination for the Preferred Alternative

Describe the rationale for the suitability determination of the preferred alternative:

Recommend against designation. Segment 1 is already in congressionally designated wilderness and segment 2 is in a wildland setting that is recommended for the Mono Wildlife Special Interest Area.

Piru Creek

Piru Creek Study Area Summary

Name of River: Piru Creek

Location: State of California, Ventura and Los Angeles County, Los Padres National Forest

The study for Piru Creek includes the main stem from its origin downstream to the maximum pool of Pyramid Lake and from 300 feet below the dam at Pyramid Lake downstream to the maximum pool at Lake Piru. For the purposes of this study, Piru Creek has been divided into seven segments. Segments 1 through 4 are referred to as upper Piru and segments 5 through 7 are referred to as lower Piru.

Upper Piru

Segment 1: Piru Creek is considered to be free flowing below a point in the Sespe Wilderness in the southwest corner of T6N, R22W, Sec 3. Segment 1 includes the main stem from its source within the Sespe Wilderness to the wilderness boundary along the eastern edge of T7N, R21W, Sec 31, SBBM.

Segment 2: From the Sespe Wilderness boundary to one-quarter mile below Gold Hill crossing (T7N, R19W, Sec 18, SBBM).

Segment 3: From one-quarter mile below Gold Hill crossing downstream to the Castaic Mine located on private land in T7N, R19W, Sec 22, SBBM.

Segment 4: Downstream from Castaic Mine to the maximum pool of Pyramid Lake.

Lower Piru

Segment 5: Starts 300 feet below Pyramid Lake Dam and continues downstream to the Sespe Wilderness boundary in southwest corner of T6N, R18 W, Sec 14, SBBM.

Segment 6: Starts at the Sespe Wilderness boundary and ends where Piru Creek leaves the Sespe Wilderness in T5N, R18N, Sec 4, SBBM.

Segment 7: Starts at the Sespe Wilderness boundary and continues downstream to the maximum pool of Lake Piru.

River Mileage:

River Segment	Miles Studied	Miles Eligible
1	5.8	5.8
2	20.4	20.4
3	4.7	4.7
4	7.6	7.6
5	3.7	0.0
6	12.7	0.0
7	2.4	0.0

Studied: 57.3 miles

Eligible: 38.5 miles

Piru Creek Eligibility Inventory

Determination of Free-flow:

There are no impoundments.

Dams at Pyramid Lake and Lake Piru impound Piru Creek. California Department of Water Resources controls releases from Pyramid Lake. In the 1990's, sporadic releases were made that caused radical, rapid fluctuations in water levels. Complaints were lodged from numerous river users caught unaware of the sudden water level changes. The releases have been somewhat tempered lately. The reason is not certain, but it may be due to the complaints and to wildlife values downstream that depend on flows more closely mimicking natural flow regimes prior to the installation of the impoundments.

As stated on page 15 of the Q&A Section of the Wild and Scenic River Reference Guide, "#any section of river with flowing water meets the technical definition of free flowing, even if impounded upstream." Thus, segments 5, 6, and 7 are considered free flowing.

Determination of Outstandingly Remarkable Values (ORVs):

1. Scenery

Description: Approximately 80% of Piru Creek is scenic attractiveness class "A" landscape, within the Southwest Mountain and Valley Character type. It is distinctive not only because of the presence of water, but also because of the mix of landform, color and vegetation that offer a variety that is distinctive.

Upper Piru Creek

The headwaters of Piru Creek show little presence of water. The character is one of openness with great color contrasts of buff and white against the deep greens of tall pines. Near Thorn Meadows, there is a sense of enclosure as the land flattens and human encounters are more prevalent in the intermittent pools. Piles of rocks in a forested setting are mixed with the pools. The creek moves through narrow and broader spaces among the vertical trees and creates a remarkable setting.

From Lockwood Flat, the river proceeds through a canyon gorge that is very rocky and has steep slopes with sparse vegetation on the south slopes. The distinct riparian zone is nearly 100 feet wide as Piru Creek is seasonally fast moving and turbulent as canyon wall springs add water to the flow. The creek then widens out as it approaches the Goldhill area.

After Goldhill, the canyon again tightens to only 50 to 60 feet wide. The flow proceeds over steeper landscapes with many boulders and sharp rock outcrops. Although the vegetation is sparse, the chaparral clings to the canyon walls and the horizontal lines of the bluffs and dramatic whites and buff colors are dominant. Beyond Snowy Creek, the creek twists and turns and creates a sense of coming out of the mountains as it enters a landscape more typical of the character type. This landscape only serves as a contrast to the drama of the other sections.

At Buck Creek, Piru Creek enters a new gorge creating strong enclosure within the steep walls. The rich colors of the riparian vegetation have openings to views of chaparral covered and barren slopes. Soils and rock outcrops turn brick red, creating contrasts with the perennial water and the sounds moving quickly past large boulders and moisture in the air as the creek flows into Pyramid Lake.

Lower Piru Creek

Below Pyramid Lake, the vegetation and landform are less dramatic, although the river has many twists and turns. At Ruby Canyon, there are rock outcrops, steep slopes, and strong side canyon drainages. The riparian vegetation is less dramatic with limited variation as the creek widens and straightens out its course. Views are of a savannah, chaparral landscape.

Determination: Scenic values are not considered to be outstandingly remarkable.

2. Recreation

Description:

Upper Piru Creek

The upper portion of Piru Creek above Pyramid Lake offers visitors from southern California a chance to recreate in and around a stream corridor with a year-round stream. Visitors are allowed access into a variety of settings

including steep canyon walls as well as open stretches with panoramic views of the creek and surrounding countryside. Access varies from hiking and horseback to off highway vehicle routes and forest development roads. There are a variety of camping opportunities along the stream channel.

Segment 1: The headwaters of Piru Creek lie within the Sespe Wilderness. Within the Wilderness, there exists the opportunity for hiking and horseback riding along trails, which parallel and cross portions of both the main stem and the South Fork of Piru Creek. Several small campgrounds (1 to 4 units) as well as the opportunity for general forest camping are available. There are opportunities for solitude along the stream; however, spring and early summer weekends often find popular areas such as the Fishbowls mildly congested with users who have come to fish or just soak in the pools.

Segment 2: The section between Thorn Meadows and Halfmoon Campground has a graded dirt road paralleling and crossing the creek with the road rarely being more than 200 yards distant. This portion sees moderate to heavy use from users driving for pleasure or using the road to link off highway vehicle routes in the area. This portion is popular with woodcutters in the summer and fall, and with hunters during the fall deer season.

Between Halfmoon and Goldhill Campgrounds, the stream corridor is utilized primarily by off highway vehicle users along the Piru Off Highway Vehicle Route. The first three miles downstream from Halfmoon Campground is open to motorized vehicles. From that point downstream, the route is open only to motorcycles. Most of the use is day use; however, some users take the opportunity to camp along this section. This area also sees some hunters during the deer season. The off highway vehicle route along the stream corridor provides an unusual experience for users since portions of the route are within the stream channel. This provides a challenging and different experience than is not readily available in southern California.

The Goldhill area is a popular camping area and day use destination. An improved road accesses the area and crosses Piru Creek as it continues on to Alamo Mountain. In addition to camping, many visitors use Goldhill as a staging area for off highway vehicle rides on routes in the surrounding area and use the opportunity to soak in the creek.

Segment 3: From Goldhill to Snowy Off Highway Vehicle Routes, access for the general public is only available by scrambling cross-country or often down the stream itself. The occasional hunter, fisherman and adventurous hiker can find solitude and a landscape showing little evidence of man’s presence. The private landowner has a four-wheel drive access road to the Castaic Mine, which is in this segment of the creek.

Segment 4: The junction of Snowy Off Highway Vehicle Route and Piru Creek provides motorcyclists an opportunity to cool down either before or after they have traversed one of the more difficult motorcycle routes on the Mount Pinos District. This challenging route is well known throughout the southern California off highway vehicle community.

Between Snowy Crossing and Hardluck Campground, access is once again limited to the hiker scrambling down the stream channel. The opportunities for solitude exist; however, this segment lacks the spectacular scenery of the gorge below Goldhill.

Hardluck Campground is accessed by an improved road and provides 24 campsites on the stream terrace above Piru Creek. The campsites on the stream terrace above Piru Creek are popular. The area has been popular with recreationists for the water play opportunities. Presently there is a seasonal access and public use Forest Closure Order in and around Hardluck Campground for preventing adverse impacts to the arroyo toad (*Bufo californicus*), an endangered species. The area also receives moderate hunting use during deer season. Hardluck Campground serves as a trailhead to access the Buck Creek area of the Sespe Wilderness. An old roadbed serves as the trail along Piru Creek to the junction of Buck Creek where Forest Trail 18W01 begins climbing along Buck Creek and on into the Wilderness where it is closed to motorized access by the general public.

Below Buck Creek, there is an opportunity to scramble along the creek through another gorge. Solitude is once again available; however, as you approach Pyramid Lake, the chance of meeting boaters on a short hike up Piru Creek increases.

Lower Piru Creek

Segment 5: Below Pyramid Lake, Piru Creek has intensive amounts of recreation use. On a typical summer weekend, several thousand users will converge on a one-mile stretch through Frenchman’s Flat, mostly for picnicking and water play. There are also five developed campsites. Anglers try to catch rainbow trout that are

stocked there as part of a catch and release program. Although the area is popular, most users tend to be from the local area (Los Angeles and Orange Counties), demonstrating that its popularity is not well known within the region or beyond. While actual use statistics are not available, an estimated 90% of all users of this creek are from this local area. The remaining 10% (in order of importance) come from various areas within California, other states, and even other countries. Visitors are not willing to travel long distances to use the river resources for recreational purposes.

Segment 6: Piru Creek offers primitive recreation opportunities within the Sespe Wilderness. There are no trails to allow access to this segment. Due to this factor, use is fairly light, as users must rock-hop up or down the stream inside a steep, narrow canyon. The result is a high degree of solitude and self-reliance. Fishing is the main attraction to many users; others come for the natural setting and to hike.

Segment 7: Downstream from the Sespe Wilderness to Lake Piru, the corridor contains dirt roads, several parcels of private property, and Blue Point Campground. Blue Point Campground is currently closed due to wildlife concerns. The campground offered 43 units and was a popular destination due to its streamside location and proximity to Los Angeles. Due to the closure, the campground and adjacent Piru Creek are deserted except for an occasional angler or hiker trekking through to go upstream.

Determination:Above Pyramid Lake, the opportunity to recreate in and along a year-round stream is a limited opportunity in Southern California and is considered to be outstandingly remarkable. The segment of Piru Creek from Halfmoon to Goldhill is unique in that it provides opportunities for off highway vehicles in and adjacent to the stream channel. The section between the Goldhill and Snowy Off Highway Vehicle Routes, especially above Castaic Mine, provides an outstanding opportunity for solitude in a very scenic gorge. The opportunity for panning and sluicing at Hardluck and Goldhill Crossings is something that is not readily available to southern Californians.

The recreation values between Pyramid Lake and Lake Piru are not considered to be outstandingly remarkable, particularly in comparison with similar recreation attributes found within Sespe Creek.

3. Geology

Description: The east-west trending Transverse Ranges include California's highest peaks south of the central Sierra Nevada and the only Precambrian rocks in the coastal mountains of the United States. The Transverse Ranges are a unique geomorphic, stratigraphic, petrologic, and structural belt 400 km long and 100 km wide that is offset by a few tens of kilometers right laterally by the northwest trending San Andreas fault system. The prominent east-west trend of the Transverse Ranges is unique among the rest of the northwest-southeast trending coastal ranges in California. It has been proposed that they have rotated significantly from their original position. Along the entire mapped length of the San Andreas Fault Zone, from northern California to Mexico, no other belt of rocks, structure, and geomorphology similar to the Transverse Range Province crosses the zone. In addition, despite their comparatively small area, the Transverse Ranges seem to incorporate a greater spectrum of rock types and structure than any other province in the state. The Transverse Ranges may be the result of compressional forces along the Big Bend in the San Andreas Fault that itself is a unique geologic feature in North America if not the world.

Upper Piru Creek

Piru Creek first flows through Tertiary sedimentary rocks (Matilija Sandstone and Juncal Formation interbedded sandstones and shales) from its headwaters to near Halfmoon Campground. From Halfmoon Campground to Buck Creek, the creek flows northeast through Precambrian basement rocks of granite and gneiss. From about the junction with Smith Fork, Tertiary sedimentary rocks form one or both sides of the creek down to Pyramid Lake. From Lockwood Flat to just west of Gold Hill, a thrust fault juxtaposes Precambrian rocks (gneiss and augen gneiss) over Tertiary rocks (Hungry Valley Formation – terrestrial sandstones) on the north side of the creek. From Smith Fork to Buck Creek, Piru Creek is aligned with the San Gabriel Fault. As Upper Piru Creek passes through alternately erosive and resistant rock types, the result is a distinct variation in landforms ranging from broad alluvial sub-basins to rugged gorges with steep rock cliffs and exposures. This variation adds to the scenic quality and geologic interest. Piru Creek Gorge cuts through a unique outcropping of the "Violin Breccia", a geologically significant recreational-educational resource.

Following is an excerpt from the environmental Impact Survey Report for the Priu Creek Project, a study in 1972 evaluating a proposed new dam in Piru Creek, one mile above Pyramid Reservoir:

"Perhaps one of the most critical considerations regarding the geology of the gorge is its uniqueness. The Violin Breccia has a strategraphic thickness of 27,000 feet. The entire stratigraphic thickness of the Ridge Basin group, of which the Violin Breccia is a unit, is about 33,000 feet, one of the thickest known sections of upper Miocene and Pliocene rocks in the world (Crowell, 1953). The Violin Breccia represents a short steep alluvial fan deposit of incredible thickness, accumulated at the toe of the rising San Gabriel Fault Block.

"There is no other formation in the western United States exhibiting this extreme thickness, yet covering such a small area. The exposure in the Piru Gorge is even more unique in providing a section, as it were, right through the center of the formation. Add to this the interesting arch formation, and springline, plus the overall scenic effect, and here is an area rivaling many National Parks and monuments in both uniqueness and beauty#it is the features of this gorge which provide much of the recreational value here#"

Piru Creek is an historic mining district and was a popular location in southern California for panning sluicing, and dredging for gold. The creek is closed to dredging by the California Department of Fish and Game. The Castaic Mine is a patented mining claim that was developed for gold. Placer mining along Piru Creek began in 1841 by Andrew Castillero and gold from the district was shipped to the U.S. Mint in Philadelphia in 1842. Small-scale placer mining continued intermittently through the 1880's and there was some work again in the 1920's and 1930's. Among lode gold mines, the principal operation was the Castaic mine, which had an estimated output valued at $160,000. The placer deposits are in and adjacent to the upper part of Piru Creek, chiefly in the vicinity of its junction with Lockwood Creek and to the east of Gold Hill. Based on the amount of exploration, which has taken place in the area over the last 150 years, and recent assessments of gold potential; it is not likely that an economic mining operation could be conducted on Piru Creek, although there is still interest in panning and sluicing from a recreational standpoint.

Lower Piru Creek

Piru Creek, below Pyramid Reservoir, flows through scenic tilted layers of sedimentary rocks of the Ridge Basin Group, then turns back to the west and crosses the San Gabriel Fault zone into Precambrian gneiss (metamorphic) and Mesozoic to Precambrian granitic (igneous) and gneissic rocks, then turns south and crosses the Pine Mountain Fault into a thick sequence of Tertiary marine and non-marine sedimentary rocks. Piru Creek winds its way through tight bends in 1500 to 2000 ft. deep canyons, displaying active debris slides on canyon walls and deep pools and carved granitic boulders in its upper reaches. In the lower half, the creek cuts gentler curves in shales, sandstones and conglomerates, and exhibits broadly folded and steeply dipping sedimentary rock types, fault contacts, and numerous massive old landslides near the creek and up side canyons. The most spectacular is a bedding plane slide up Agua Blanca Creek at Devils Potrero, covering almost a square mile, which blocked a drainage to form the closed basin called The Pothole, just above the scenic Devil's Gateway. Fossils are common in some of the marine sedimentary rocks.

Some of the first gold discovered in California, as well as oil and gas developments, occurred in tributaries of the lower reaches of Piru Creek. Some of the Miocene age strata along the lower portion of Piru Creek are productive in oil fields to the south. Granitic rock from Whitaker Peak provides much of the gravel and boulders in Piru Creek.

Determination: The basement rocks that outcrop along Piru Creek from Halfmoon Campground to Buck Creek are considered to be outstandingly remarkable. These rocks are banded gneisses and migmatites. Geologically these rocks are important because exposures of basement rocks provide important clues to this less well-understood portion of North America's tectonic history.

The sedimentary rocks of the Ridge Basin group, which outcrop from Smith Fork to Pyramid Lake, are considered to be outstandingly remarkable. Along Piru Creek, both Peace Valley and Hungry Valley formations outcrop in low cliffs. These rocks include conglomerates with cobbles of the basement rocks and are important to the study of the development of the Ridge Basin that coincided with movement on the San Gabriel Fault. These rocks provide critical information about the tectonic history of the unique Transverse Ranges.

The San Gabriel Fault is one of several important structural features in southern California. From Smith Fork to Buck Creek, it follows Piru Creek and splinters into two sections that form a sliver of Tertiary rocks. This feature may provide important information regarding the history of movement along this fault and is considered to be outstandingly remarkable.

Similar formations and structures are found in the lower portion of Piru Creek but are not considered to be

outstandingly remarkable, particularly in comparison with the features found in the upper portion of Piru Creek as described above.

4. Fish and Wildlife

Description:

Upper Piru Creek

Piru Creek has current, historic, and potential populations of threatened, endangered and sensitive species in the riparian corridor from Fish Bowl Campground to Pyramid Lake. Wildlife observations in the watershed of Upper Piru Creek include three federally endangered species: arroyo toad (*Bufo californicus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and California condor (*Gymnogyps californianus*). Also, Forest Service designated sensitive species were also observed: Northern goshawk (*Accipiter gentilis*), California spotted owl (*Strix occidentalis occidentalis*), willow flycatcher (*Empidonax traillii*), and southwestern pond turtle (*Clemmys marmorata pallida*).

Piru Creek has about 4.5 miles of critical habitat for arroyo toads in those sections that are below 3600 feet in elevation.

The southwestern form of willow flycatcher is a federally endangered subspecies, the northern subspecies of willow flycatcher is considered a Forest Service sensitive and a California endangered species. Critical habitat for southwestern willow flycatcher was designated in 1997; however, pending settlement of a lawsuit, the designation may be revoked during 2002. Suitable habitat was documented in Upper Piru Creek. In 2001, occupancy surveys in Upper Piru noted three southwestern willow flycatchers during the breeding season and two presumed migratory northern willow flycatchers.

Upper Piru Creek is within the Critical Habitat boundaries for California condor. Historic nest sites are located near Hardluck Campground.

Northern goshawks were observed nesting in 2000 and were also observed in 2001 in the vicinity of Half Moon Campground. Surveyors found California spotted owls in Piru Creek and Buck Creek. In general, surveyors found spotted owls in riparian zones within mixed-conifer forests. The two-striped garter snake and southwestern pond turtle have been observed along upper Piru Creek and Lockwood Creek where they are considered somewhat common.

The low water crossing near Hardluck Campground has recently been improved; however, since its initial construction the crossing has acted as a barrier to upstream movement of exotic fish such as brown trout, green sunfish and small-mouth bass. These exotics can be quite predatory or otherwise detrimental to native aquatic and semi-aquatic wildlife, especially fish and amphibians. The native amphibian fauna above the crossing include California and pacific chorus frogs and western and arroyo toads. The latter is a federally endangered species. As such, that section of Piru Creek above Hardluck Crossing can be considered a refugium for native aquatic and semi-aquatic wildlife species.

Lower Piru Creek

Lower Piru Creek contains suitable habitat for several designated threatened, endangered, and sensitive wildlife species.Wildlife observations in the watershed of lower Piru Creek include the federally threatened California red-legged frogs, *Rana aurora draytonji*, and three federally endangered species: arroyo toad, *Bufo californicus*; least Bell's vireo, *Vireo bellii pusillus*; and California condor, *Gymnogyps californianus*. Also, Forest Service sensitive species were also observed: two striped garter snake, *Thamnophis hamondi*, and southwestern pond turtle, *Clemmys marmorata pallida*. Native fish species such as the rainbow trout and the arroyo chub also inhabit the Lower Piru.

Piru Gorge is relatively narrow with steep canyon walls bordering either side of the creek. The narrow riparian habitat corridor consists mostly of scattered stands of valley oak and sycamore with thickets of arroyo willow and mulefat bordering the stream margins.

Pyramid Dam has modified lower Piru Creek itself and consequential water releases from Pyramid to Lake Piru. The natural dynamics of stream flow and sediment transport within the channel have been modified significantly. Natural stream flows that historically dried out in late summer have been replaced by a year-round artificial flow created by water releases from Pyramid. Not only have the water releases sustained a year-round flow, but have

also introduced several non-native species from the state water project to the detriment of native species. Non-native species include but are not limited to bullfrog, small and large-mouth bass, black bullhead and green sunfish.

Remnant populations of arroyo toad occur in lower Piru Creek. Cattle grazing on private lands, recreation, and the introduction of exotic fish and bullfrogs from Lake Piru and Lake Pyramid are currently affecting these populations. The populations of arroyo toad have increased slightly since the early 1990's. The lower portion of Piru Creek includes approximately 16 miles of federally designated critical habitat for the species. Most of the arroyo toad observations have been in the lower half of the drainage. Most of the impacts to toads occur on the lower three miles of stream.

Lower Piru Creek contains critical habitat for the federally endangered California condor including several historic roost and nest sites. Least Bell's vireo habitat exists within the drainage. Potential habitat is found for the peregrine falcon, *Falco peregrinus anatum* (Forest Service sensitive).

Lower Piru Creek includes historic California red-legged frog habitat, including approximately 16 miles of federally designated critical habitat for the species. Recent surveys suggest the California red-legged frog has been extirpated from the entire Piru Creek watershed.

Determination: The segment above Hardluck Crossing is unique in that it acts as a refugium for native California amphibians and other native aquatic and semi-aquatic species that may occur. This assemblage of native species includes the endangered arroyo toad as well as several Forest Service sensitive species. This attribute can be considered an outstanding and remarkable value of the segment, especially since other such areas are extremely rare on the Forest and in southern California in general.

The population of arroyo toads in the Blue Point area and potential habitat areas for least Bell's vireo and southwestern willow flycatcher near Lake Piru are not considered to be outstandingly remarkable amongst other drainages with similar habitat and species components, particularly with those in other eligible Wild and Scenic Rivers (upper Piru Creek, Sespe, Indian, and Mono).

5. Heritage resources (Cultural)

Description: Many segments of the corridor have been inventoried across at least part of their width, often for several miles. However, several areas remain to be inventoried.

The heritage resource is characterized by an abundance of prehistoric sites containing time-diagnostic materials. The tendency for even apparently small sites to contain a variety of lithic raw materials and the substantial number of sites that contain bone (especially burned) and apparent bone tools warrant additional study. The unexpectedly high number of sites having obsidian provides time-related and sourcing information. Shell and glass beads found at multiple sites provide time-diagnostic and other information and may represent cultural interactions. The presence of cupules at various sites is thought to represent religious activities.

Determination: The scientific and interpretive values offered by several of the prehistoric/ethnographic sites of Piru Creek above Pyramid Lake constitute outstandingly remarkable values. The portion of the study area above Pyramid Lake (segments 1 to 4) has values that are clearly defined relative to those in the lower portion (segments 5 to 7). Thus, the heritage values are considered outstandingly remarkable in the upper portion of this study area, with the relevant characteristics suspected but not demonstrated for the lower portion.

The presence of the shells, glass beads, and obsidian (for which dating and sourcing studies can be completed) has potential to supply information on use of the stream corridor as a trade or travel route. Another factor is that the numerous sites having time-diagnostic materials offer information on the use of particular landforms and areas of the drainage over time. The varieties and types of materials present also contribute to the scientific potential of the area's sites. A final factor is that scientific collection of materials from many of the sites has taken place; the nature and variety of materials obtained have very high potential for off-site interpretation.

6. Heritage resources (Historic)

Description: Regarding the historic materials, a distinctive characteristic is the quantity of sites associated with mining (multiple sites are present in the upper portion of the study area, and at least one is known for the lower portion). Note the discussion in the geological section, which states that placer deposits (as linked to modern activities) are significant at the local level. Historically speaking, the sites taken together are likely significant at the local level, and perhaps beyond it; research would need to be done to place the sites in context.

Determination: Based on current knowledge, the historic values are not outstandingly remarkable.

7. Other (Botany)

Description: The botanical resources of Piru Creek are fairly well known due to the creek's proximity to roads and trails and the inclusion of the study corridor in other project analyses; however, no systematic effort has been made to inventory the botanical resources found in the study corridor. There are no known occurrences of endangered, threatened, proposed, candidate, or sensitive plant species within one-quarter mile of Piru Creek. There are a number of occurrences of sensitive plant species in the Piru Creek watershed but these populations all occur more than one-half mile from the creek.

Determination: Botanical values are not considered to be outstandingly remarkable.

Summary of Outstandingly Remarkable Values:

Recreation

The upper portion of Piru Creek provides an outstandingly remarkable opportunity to recreate in and along a year-round stream.

Geology

The faults and rock formations along Piru Creek include important features crucial to the understanding of the very complex structural and geomorphic evolution of the west coast of North America. Along the upper portion of Piru Creek, exposures of the oldest basement rocks in the coastal mountains of the western U.S, composed of gneisses and migmatites, sedimentary rocks of the Ridge Basin Group, and structural features of the San Gabriel Fault are considered to be outstandingly remarkable.

Wildlife

In the upper portion of Piru Creek, the protected aquatic habitats above the Hardluck Crossing and the population of arroyo toads at Hardluck Crossing are considered to be outstandingly remarkable.

Cultural

The scientific and interpretive values offered by several of the prehistoric/ethnographic sites constitute outstandingly remarkable values in the upper segments of Piru Creek.

Potential Classification

See table 441: Piru Creek - Potential Classification by River Segment.

Piru Creek Suitability Report

Description

Landownership and Land Uses

Segment 1: Piru Creek is considered to be free flowing below a point in the Sespe Wilderness in the southwest corner of T6N, R22W, Sec 3. Segment 1 includes the main stem from its source within the Sespe Wilderness to the wilderness boundary along the eastern edge of T7N, R21W, Sec 31.

Segment 2: From the Sespe Wilderness boundary to one-quarter mile below Gold Hill crossing (T7N, R19W, Sec 18).

Segment 3: From one-quarter mile below Gold Hill crossing downstream to the Castaic Mine located on private land in T7N, R19W, Sec 22.

Segment 4: Downstream from Castaic Mine to the maximum pool of Pyramid Lake.

River mile location is from the source (see table 448: Piru Creek - Segment Description).

Mineral and Energy Resource Activities

Piru Creek is an historic mining district and was a popular location in southern California for panning sluicing, and dredging for gold. The creek is closed to dredging by the California Department of Fish and Game. The

Castaic Mine is a patented mining claim that was developed for gold. Placer mining along Piru Creek began in 1841 by Andrew Castillero and gold from the district was shipped to the U.S. Mint in Philadelphia in 1842. Small-scale placer mining continued intermittently through the 1880's and there was some work again in the 1920's and 1930's. Among lode gold mines, the principal operation was the Castaic mine, which had an estimated output valued at $160,000. The placer deposits are in and adjacent to the upper part of Piru Creek, chiefly in the vicinity of its junction with Lockwood Creek and to the east of Gold Hill. Based on the amount of exploration, which has taken place in the area over the last 150 years, and recent assessments of gold potential; it is not likely that an economic mining operation could be conducted on Piru Creek, although there is still interest in panning and sluicing. Entire length of upper Piru Creek should be withdrawn from mineral entry due to threatened and endangered species and heritage resource concerns. It is unlikely that the Castaic Mine will have future operations due to threatened and endangered species concerns.

Water Resources Development

A dam at Pyramid Lake operated by the California Department of Water Resources impounds Piru Creek. The California Department of Water Resources rejected a proposal for construction of another dam in segment 4 on upper Piru Creek based on an Environmental Impact Report in 1972. Portions of segments 2, 3, and 4 and located within a former power withdrawal identified as Federal Power Commission Order for Power Project 64 on August 24, 1921. Most of the power withdrawal was rescinded in 1986. None of the upper Piru Creek is presently within a power withdrawal. Future water resource development is unlikely due to threatened and endangered species concerns.

Transportation, Facilities and Other Developments

Segment 1 contains several small campgrounds (1 to 4 units) as well as the opportunity for general forest camping are available. There are opportunities for solitude along the stream; however, spring and early summer weekends often find popular areas such as the Fishbowls mildly congested with users who have come to fish or just soak in the pools.

Segment 2, between Fishbowls Trailhead and Halfmoon Campground, has a graded dirt road paralleling and crossing the creek with the road rarely being more than 200 yards distant. Between Halfmoon and Goldhill Campgrounds, the stream corridor is utilized primarily by off highway vehicle users along the Piru Off Highway Vehicle Route. The first three miles downstream from Halfmoon Campground are open to motorized vehicles. From that point downstream, the route is open only to motorcycles. An improved road accesses the area and crosses Piru Creek as it continues on to Alamo Mountain.

In segment 3 between Goldhill and Snowy Off Highway Vehicle Routes, access for the general public is only available by scrambling cross-country or often down the stream itself. The private landowner has a four-wheel drive access road to the Castaic Mine, which is in this section of the creek.

In segment 4, the Snowy Off Highway Vehicle Route accesses Piru Creek; the route is well known throughout the southern California off highway vehicle community. Hardluck Campground is accessed by an improved road and provides 24 campsites on the stream terrace above Piru Creek. Hardluck Campground serves as a trailhead to access the Buck Creek area of the Sespe Wilderness. An old roadbed serves as the trail along Piru Creek to the junction of Buck Creek where Forest Trail 18W01 begins climbing along Buck Creek and on into the Wilderness where it is closed to motorized access by the general public.

Recreation Activities

The upper portion of Piru Creek above Pyramid Lake offers visitors from southern California a chance to recreate in and around a stream corridor with year-round flows. Visitors are allowed access into a variety of settings including steep canyon walls as well as open stretches with panoramic views of the creek and surrounding countryside. Access varies from hiking and horseback to off highway vehicle routes and forest development roads. There are a variety of camping opportunities along the stream channel.

The headwaters of Piru Creek lie within the Sespe Wilderness. Within segment 1, there exists the opportunity for hiking and horseback riding along trails, which parallel and cross portions of both the main stem and the South Fork of Piru Creek.

Segment 2 sees moderate to heavy use from users driving for pleasure or using the road to link off highway vehicle routes in the area. This portion is popular with woodcutters in the summer and fall and with hunters

during the fall deer season. Between Halfmoon and Goldhill Campgrounds, most of the use is day use; however, some users take the opportunity to camp along this section. This area also sees some hunters during the deer season. The off highway vehicle route along the stream corridor provides an unusual experience for users since portions of the route are within the stream channel. This provides a challenging and different experience that is not readily available in southern California. The Goldhill area is a popular camping area and day use destination. In addition to camping, many visitors use Goldhill as a staging area for off highway vehicle rides on routes in the surrounding area and use the opportunity to soak in the creek.

In segment 3, the hunter, angler, or adventurous hiker can find solitude within a landscape showing little evidence of human presence.

The junction of Snowy Off Highway Vehicle Route and Piru Creek provides motorcyclists an opportunity to cool down either before or after they have traversed one of the more difficult motorcycle routes on the Mount Pinos District. This challenging route is well known throughout the southern California off highway vehicle community.

Between Snowy Crossing and Hardluck Campground, access is once again limited to the hiker scrambling down the stream channel. The opportunities for solitude exist; however, this section lacks the spectacular scenery of the gorge below Goldhill.

Hardluck Campground has been popular with recreationists for the campsites on the stream terrace above Piru Creek and water play opportunities. Presently there is a seasonal access and public use Forest Closure Order in and around Hardluck Campground for preventing adverse impacts to the arroyo toad (Bufo californicus), an endangered species. The area also receives moderate hunting use during deer season.

Below Buck Creek, there is an opportunity to scramble along the creek through another gorge. Solitude is once again available; however, as you approach Pyramid Lake, the chance of meeting boaters on a short hike up Piru Creek increases.

Other Resource Activities

Dead and down fuel wood harvesting occurs with possibilities of forest health thinnings to support other resource values in segment 2. One grazing allotment exists in segments 1 and 2, from the headwaters to about 20 miles downstream. Active and planned prescribed burns are adjacent to segments 2 and 3 on Alamo Mountain. Threatened and endangered species (arroyo toad and southwestern willow flycatcher) monitoring occurs in all segments.

Special Designations

Segment 1 occurs within the Sespe Wilderness from the headwaters to about five miles downstream. Piru Creek has been designated a Wild Trout Stream by the California Department of Fish and Game. These designations are complimentary to, and do not conflict with, inclusion of upper Piru Creek into the Wild and Scenic River System.

Socio-Economic Environment

The mountain communities in the Frazier Park area (approximately 10,000) are the closest population centers to Piru Creek. Much of the recreational use comes from the population centers of Los Angeles, Ventura and Kern Counties. Approximately 25 miles away from segments 3 and 4, Tejon Ranch has proposed a 23,000 home community to be called Centennial. Planned development is to start in three to five years. Designation as a Wild and Scenic River would have minimal impact on use patterns, except potentially to encourage use from more geographically distant visitors.

Current Administration and Funding Needs if Designated

The Los Padres National Forest administers all of Piru Creek except the few private parcels listed above. The private land is within Ventura County.

	Expenses Independent of Designation	Additional Expenses with Designation
General Administration *	**$60,000**	**$33,000**

Development of River Management Plan	**$ 0**	**$150,000**
Development Costs	**$750,000**	**$10,000**
Operation and Maintenance Costs	**$100,000**	**$5,000**
Total Cost First Five Years	**$910,000**	**$198,000**

* General administration and operation and maintenance costs are estimated to continue at $ 20,000 annually.

Suitability Factor Assessment:

1. Characteristics that do or do not make the area a worthy addition to the National System.

Worthy: The recreational, heritage, wildlife and geological characteristics make it a worthy addition for all segments. Piru Creek offers year round streamside recreation in an area where few streams exist adjacent to large populations. The creek offers scientific and interpretive values for historic and prehistoric/ethnographic sites. Two endangered species are located along the creek. Along the upper portions of Piru Creek, exposures of the oldest basement rocks in the coastal mountains along with structural features of the San Gabriel fault, offer an outstanding scientific and interpretive resource.

Unworthy: Due to low water flows, opportunities for boating/floating activities such as rafting and kayaking do not exist.

2. The current status of land ownership and use in the area.

The private parcel in segment 2 is used to support livestock grazing operations. The Castaic Mine (approximately 58 acres at the break between segments 3 and 4) is inactive with no plans of mining at this time. The owner of the mine has expressed an interest in a land exchange with the National Forest. The rest of the land is in the National Forest System.

3. The reasonable foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed if the area were included in the System.

If the corridor were permanently withdrawn from mineral entry, a reduction in small-scale placer mining operations would occur. This would reduce the negative effects of mining on threatened and endangered species; heritage resources; and watershed impacts. The mineral report from 1994 concluded that an economic mining operation could not be conducted on upper Piru Creek. Other uses would remain about the same if above segments are adopted.

4. The federal agency that will administer the area, should it be added to the System.

USDA Forest Service.

5. The extent to which the agency proposes that administration of the river, including the costs thereof, be shared by State and local agencies.

No proposals exist to share costs with State or local agencies.

6. The estimated cost to the United States of acquiring necessary lands and interests in land and of administering the area, should it be added to the system.

No acquisitions are necessary at this time. The owner of the Castaic mine has expressed an interest in a land exchange with the Forest Service. The owner of the 160-acre private parcel has not to date express any interest in a land exchange. Both parcels are habitat to endangered species.

7. A determination of the degree to which the State or its political subdivisions might participate in the preservation and administration of the river, should it be proposed for inclusion in the System.

The California Department of Fish and Game will continue to enforce restrictions on dredging.

8. State and/or Local government's ability to manage and protect the outstandingly remarkable values on non-federal lands.

State and local governments will be responsible for regulation and enforcement of threatened and endangered species protection.

9. Support or opposition to designation.

Opposition from mining, off highway vehicle, and other use groups is anticipated. Support is expected from environmental groups.

10. Potential for water resources development.

The California Department of Water Resources rejected a proposal for construction of another dam in segment 4 on upper Piru Creek based on an Environmental Impact Report in 1972. Portions of segments 2, 3 and 4 and located within a former power withdrawal identified as Federal Power Commission Order for Power Project 64 on August 24, 1921. Most of the power withdrawal was rescinded in 1986. None of the upper Piru Creek is presently within a power withdrawal.

11. Contribution to other regional objectives/needs.

Protection of endangered species habitat would help meet objectives of the U.S. Fish and Wildlife Service, California Department of Fish and Game, and the USDA Forest Service.

Forest Plan Alternatives

Briefly describe how a particular river was treated in each of the Forest Plan alternatives:

Alternative 1: No segments are recommended for designation.

***Alternative 2*:** Segments 1 and 3 are recommended for wild river designations. Segments 2 and 4 are recommended for scenic river designations. A wild designation in segment 1 is consistent with the existing wilderness. There are no roads or other improvements in segment 3; a wild designation would maintain the primitive character of this segment. Segments 2 and 4 encompass improved dirt roads and motorized trails. Scenic designations would allow for the continued use and maintenance of these routes balanced with the need to protect and enhance the free-flowing character, water quality and outstandingly remarkable values.

Alternative 3: Wildlife is identified as an ORV all segments. Segments 1 and 3 are recommended for wild river designations. Segments 2 and 4 are recommended for scenic river designations. A wild designation in segment 1 is consistent with the existing wilderness. There are no roads or other improvements in segment 3; a wild designation would maintain the primitive character of this segment. Segments 2 and 4 encompass improved dirt roads and motorized trails. Scenic designations would allow for the continued use and maintenance of these routes. The recommended designations balance the need to protect and enhance the free-flowing character, water quality and outstandingly remarkable recreation, wildlife, geology and cultural values with the conservation of a wide range of wildlife and plant species (especially TES) and habitats, biodiversity, linkages and corridors.

Alternative 4: Recreation is identified as an ORV in all segments. Segments 1 and 3 are recommended for wild river designations. Segments 2 and 4 are recommended for scenic river designations. A wild designation in segment 1 is consistent with the existing wilderness. There are no roads or other improvements in segment 3; a wild designation would maintain the primitive character of this segment. Segments 2 and 4 encompass improved dirt roads and motorized trails. Scenic designations would allow for the continued use and maintenance of these routes.

Alternative 5: No segments are recommended for designation.

Alternative 6: Segments 1 and 3 are recommended for wild river designations. Segments 2 and 4 are recommended for scenic river designations. A wild designation in segment 1 is consistent with the existing wilderness. There are no roads or other improvements in segment 3; a wild designation would maintain the primitive character of this segment. Segments 2 and 4 encompass improved dirt roads and motorized trails. Scenic designations would allow for the continued use and maintenance of these routes. The recommended designations would protect and enhance a wide range of values and features, including species conservation, biodiversity, open space, natural beauty, recreation and research.

Suitability Determination for the Preferred Alternative

Describe the rationale for the suitability determination of the preferred alternative:

Because of the outstanding and remarkable values Upper Piru Creek offers southern California, inclusion into the

Wild and Scenic River System is recommended. Segments 1 and 3 are recommended for wild river and segment 2 and 4 for scenic river designations. In addition, all scenic river segments should be withdrawn from mineral entry to protect the habitat for threatened and endangered species and heritage resource values.

San Antonio River

San Antonio River Study Area Summary

The San Antonio River was considered for study based on input from Los Padres National Forest personnel.

Name of River: San Antonio River

Location: State of California, Monterey County, Los Padres National Forest

The San Antonio River is considered to be free flowing below a point in the Ventana Wilderness along the east flank of the Santa Lucia Range approximately two miles southeast of Cone Peak in the southern one-half of T21S, R4E, Sec 35, MDBM. The study segment of the San Antonio River flows in an easterly direction to the administrative boundary of the Los Padres National Forest (eastern edge of T21S, R5E, Sec 35, MDBM), a distance of approximately eight miles. The first 3.5 miles lie within the Ventana Wilderness. A private inholding exists immediately north of the river, east of and contiguous to the wilderness boundary. For the purposes of this study, the San Antonio River was divided into two segments.

Segment 1: Includes the headwaters of the main stem of the San Antonio River from its headwaters to the Ventana Wilderness boundary located in the southwestern one-quarter of T21S, R5E, Sec 35. The potential wild and scenic river corridor may encompass a portion of the private parcel located in T21S, R5E, Sec 33.

Segment 2: The main stem of the San Antonio River from the Ventana Wilderness boundary (southwestern one-quarter of T21S, R5E, Sec 35) to the administrative boundary of the Los Padres National Forest (eastern edge of T21S, R5E, Sec 35).

River Mileage:

River Segment	Miles Studied	Miles Eligible
1	7.6	7.6
2	1.0	1.0

Studied: 8.6 miles

Eligible: 8.6 miles

San Antonio River Eligibility Inventory

Determination of Free-flow:

The river is free flowing in segment 1. Adjacent to a barn at the Merle Ranch, segment 2 has a river impoundment that has not been used for 10 years. The structure consists of a concrete foundation with slats to seasonally impound the river. A small water supply diversion exists approximately one mile upstream from the main structures at the Merle Ranch. A 1.5’’ pipe from this diversion parallels the river for approximately one mile. The San Antonio River is determined to be free flowing.

Determination of Outstandingly Remarkable Values (ORVs):

1. Scenery

Description: Seasonal variations in riparian vegetation consisting of alder, sycamore, and various species of willow and oak are not unique in regards to other riparian areas on the district.

Determination: Scenic values are not considered to be outstandingly remarkable.

2. Recreation

Description: The upper portions of the river within segment 1 lie within the Ventana Wilderness. The San Antonio Trail parallels the river throughout this segment, providing access to Fresno and San Antonio Camps. In recent years, public access from the eastern end of the San Antonio Trail has been denied from a private landowner. The Merle Ranch area is closed to public entry, limiting access to segment 2 and the eastern portion of segment 1. Segments 1 and 2 provide good fishing opportunities. The San Antonio River is one of the few streams open to fishing on the district.

Determination: Recreational values are not considered to be outstandingly remarkable.

3. Geology

Description: The Monterey District of the Los Padres National Forest is in the southern Coast Ranges of California. This is a geologically young mountain range that was uplifted to its present height about 400,000 years ago. The range includes Mesozoic age rocks that represent a subduction zone complex (the Franciscan Complex), a magmatic arc (plutonic and metamorphic rocks of the Salinian Block) and forearc basin sediments (the Great Valley Sequence). It also includes younger Tertiary marine sediments and Quaternary largely non-marine sediments. The majority of the Monterey District is part of the Salinian Block. The Arroyo Seco, Carmel, Little Sur and San Antonio Rivers, and Tassajara Creek primarily flow through the basement rocks of this block.

The San Antonio River is structurally controlled by a linear system of folds and faults. It first flows southeast through metasedimentary rocks parallel to and sometimes within bands of marble. This course also parallels a nearby fault separating the basement metasedimentary rocks from Cretaceous marine sediments. The river bends to the northeast where it crosses the fault and then flows mostly through folded Cretaceous and Tertiary marine sediments to the Forest boundary.

Determination: The Salinian Block metasedimentary and plutonic rocks exposed by the San Antonio River are not considered to be outstandingly remarkable in comparison with similar features located elsewhere in this geologic province.

4. Fish and Wildlife

Description: The upper reaches of San Antonio Creek are relatively unaffected by human use, and contain excellent riparian habitat. Some trout inhabit this branch of San Antonio Creek, but a large population of introduced Sacramento squawfish and sucker compete with trout here. The San Antonio reservoir blocks passage of steelhead from the Salinas drainage into all of San Antonio Creek.

The arroyo toad (*Bufo californicus)*, a federally endangered species, exists on Fort Hunter Liggett downstream of the study river area.

A pair of California spotted owls (*Strix occidentallis occidentalis*), a Forest Service sensitive species, was found in 1990 on the main fork of San Antonio Creek near Fresno Camp.

Introduced bullfrogs are common within this drainage, and may be keeping the California red-legged frog out of the drainage. Southwestern pond turtles are found within the San Antonio drainage.

Determination: Although the above mentioned species are outstanding according to their definition as threatened, endangered, sensitive (TES), or rare, the habitat and wildlife resources within the San Antonio River drainage are not considered to be outstandingly remarkable amongst other drainages with similar TES habitat and species components.

5. Heritage resources (Cultural)

Description: Portions of the stream corridor between the Fresno Campground and Salsipuedes Creek have been inventoried, as have portions of the area near Merle Ranch; between these two areas is a substantial gap. Still, numerous sites are known. In particular, the area on or near Merle Ranch has an unusually dense concentration of widely varied sites, possibly including rock art, and certainly including both historic and prehistoric sites, with the

latter probably spanning several thousand years. Some of these sites are not yet fully documented.

Determination: The density and variety of the sites in the Merle Ranch area, and the time span—probably encompassing thousands of years--that they collectively represent, taken with the prehistoric and historic interpretive potential of Merle Ranch and/or other local areas, constitute an outstandingly remarkable value.

6. Heritage resources (Historic)

Description: Outside of, but relevant to, the stream corridor are additional sites, some of which possess unique qualities. One example is the Indians Ranch. This site is an exceptional representation of how Native peoples departing from the missions adapted mission practices (including viticulture) to a post-mission way of life. Ethnographically speaking, much of the recorded information on the Salinan tribe came from Perfecta Encinales, one of the original occupants of the Indians Ranch. Wagon Cave, a large cave where wagons are thought to have been stored (at least one extant historic letter reports wagon parts in the cave) as their occupants traveled to and from the coast. Wagon Cave, and potentially many of the other sites in the Merle Ranch area, are directly linked to the San Antonio drainage because the drainage served as part of the travel route connecting the local area to the coast and hence the wider world.

The general area has high interpretive potential. An interest in area cultural tourism already exists, as demonstrated by the historic San Antonio Mission; it and "The Hacienda" (part of the former Hearst Ranch), both approximately eight miles from the Merle Ranch, attract international visitors. The Merle Ranch itself is potentially an important interpretive location; the density and variety of sites found in its vicinity and the condition of the standing buildings make it in some ways ideal for such a purpose. However, one should note that several of the site types found in the area are very sensitive to use and could easily be "loved to death" by too many visitors; also, tribal concerns exist for the area in general. If the ranch itself is not deemed suitable as an interpretive location, other areas within or adjacent to the corridor provide alternatives.

Determination: The density and variety of the sites in the Merle Ranch area, and the time span—probably encompassing thousands of years--that they collectively represent, taken with the prehistoric and historic interpretive potential of Merle Ranch and/or other local areas, constitute an outstandingly remarkable value

7. Other (Botany)

Description: Riparian vegetation consists of alder, sycamore, and various species of willow and oak. There is one rare plant occurrence within one-quarter mile of the San Antonio River.

The botanical resources of the San Antonio River watershed are not well known due to the area's isolation and rough terrain. No systematic efforts have been made to inventory the botanical resources of San Antonio River.

Based on the literature, there are no known unique, outstanding, distinctive, or unusual botanical features or characteristics in the San Antonio River watershed. Although there is a sensitive plant occurrence within the study corridor, it is not considered to be a unique, outstanding, distinctive, or unusual botanical feature because of the small size of the population, the association of the species with upland habitat types, and the presence of larger, more vigorous populations in the adjoining watersheds.

Determination: The botanical resources are not considered outstandingly remarkable.

Summary of Outstandingly Remarkable Values:

Cultural and Historic

The density and variety of the sites in the Merle Ranch area, and the time span—probably encompassing thousands of years--that they collectively represent, taken with the prehistoric and historic interpretive potential of the site, constitute outstandingly remarkable values for both historic and prehistoric heritage resources.

Potential Classification

See table 443: San Antonio River - Potential Classification by River Segment.

San Antonio River Suitability Report

Description

Landownership and Land Uses

Segment 1: Segment 1 is within the Ventana Wilderness. A portion (about 45 acres) of the 120-acre private parcel in Section 33 falls within the study corridor.

Segment 2: Segment 2 includes the Merle Ranch, an acquired property. The northern one-half of the study corridor is in the Ventana Wilderness. The Merle Ranch is currently used as an administrative pasture. Improvements include two small cabins, outbuildings, and a small impoundment. The area is closed to the public.

River mile location is from the source (see table 449: San Antonio River - Segment Description).

Mineral and Energy Resource Activities

There are no known deposits of locatable or leasable minerals within the study corridor.

Water Resources Development

The river is free flowing in segment 1. In segment 2 there is a run of the river impoundment at the Merle Ranch. The structure consists of a concrete foundation with slats to seasonally impound the river (this impoundment has not been used for 10 years). A small water supply diversion exists approximately one mile upstream from the main structures at the Merle Ranch. A small diameter pipe from this diversion parallels the river for approximately one mile. There are no known Federal Energy Regulatory Commission applications or permits.

Transportation, Facilities and Other Developments

The San Antonio Trail (5E04) borders the river between Fresno and San Antonio Camps. The San Antonio Trail, which passes through the private land in section 33, has been closed to the public due to the private ownership. A Forest Service administrative site known as the Merle Ranch is located within segment 2. There are several structures and at least two roads within the river corridor at the Merle Ranch.

Recreation Activities

Moderate levels of day hiking, backpacking, and fishing occurs along the San Antonio Trail. Public access to the Merle Ranch is currently prohibited and restricts access to segment 2. Historic and prehistoric resources at the Merle Ranch lend themselves to development of interpretive facilities on the ranch. Fishing opportunities on and near the ranch could be enhanced by trail development.

Other Resource Activities

Forest Service pack stock grazes within segment 2 at the Merle Ranch. Prescribed burning is planned around the perimeter of the ranch and also along the San Antonio Trail corridor. Livestock grazes the non-federal land in section 33.

Special Designations

All of segment 1and portions of segment 2 are within the Ventana Wilderness.

Socio-Economic Environment

Located within 8 miles of the river corridor, Fort Hunter Liggett and its facilities comprise the closest community. The historic San Antonio Mission and ‘The Hacienda’, part of the former Hearst Ranch, are both found at the Fort and attract international visitors. The closest full service community is King City (18 miles). Designation of the San Antonio River as a Wild and Scenic River would have a negligible impact on the local economy. Use patterns would be unaffected.

Current Administration and Funding Needs if Designated

	Expenses Independent of Designation	Additional Expenses with Designation
General Administration	**$10,100**	**$34,300**
Development of River Management Plan	**$0**	**$150,000**
Development Costs	**$0**	**$10,000**

Operation and Maintenance Costs	**$50,500**	**$11,500**
Total Cost First Five Years	**$303,000**	**$205,800**

* General administration and operation and maintenance costs are estimated to continue at $ 12,400 annually.

Suitability Factor Assessment:

1. Characteristics that do or do not make the area a worthy addition to the National System.

Worthy: Abundant, varied historic and prehistoric sites are present within and near the river corridor, and probably represent an occupation sequence spanning thousands of years. Sites both in and near the river corridor can be argued to be linked not only to each other but to the river corridor as a means of connection to the ocean and thus to the larger world.

This corridor could, based upon the heritage resources, be considered a worthy addition to the National System if the interpretive potential of this location is realized. Doing so would require carefully planned and diligently implemented measures to protect sensitive heritage resources. Such measures may be needed in any case if existing recreational opportunities are enhanced or if new recreational opportunities are developed in this area.

Not Worthy: The private parcel in segment 1 has existing houses and other developments. This land would be difficult to acquire. If it remains in private ownership, this would detract from designation. All of segment 1 is within the Ventana Wilderness. The most appropriate designation for National Forest System lands would be a wild river. The developments on the private parcel and the road accessing this parcel do not meet the criteria for this designation.

2. The current status of land ownership and use in the area.

All land in segment 1 is within the administrative boundary of the Los Padres National Forest. Approximately 45 acres of private land (Section 33) is within the river corridor in segment 1. Forest Service pack stock graze within segment 2 at the Merle Ranch. Prescribed burning is planned around the perimeter of the ranch and also along the San Antonio Trail corridor. Livestock grazing occurs on the private land in Section 33.

3. The reasonable foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed if the area were included in the System.

Potential dams/water development would be curtailed, but there are no current proposals for this kind of development.

4. The federal agency that will administer the area, should it be added to the System.

USDA Forest Service.

5. The extent to which the agency proposes that administration of the river, including the costs thereof, be shared by State and local agencies.

There are no proposals to share costs.

6. The estimated cost to the United States of acquiring necessary lands and interests in land and of administering the area, should it be added to the system.

The landowner of the private parcel in Section 33 has not expressed a willingness to convey the property to federal government. The Forest Service is required to acquire properties based on fair market value. The market value of this parcel has not been established.

7. A determination of the degree to which the State or its political subdivisions might participate in the preservation and administration of the river, should it be proposed for inclusion in the System.

Participation is unexpected.

8. Support or opposition to designation.

Local environmental groups support designation of Wild and Scenic Rivers in general, but there has been no

support for the San Antonio River specifically. Local hunting and fishing groups may oppose designation. The Monterey Ranger District is 92% Wilderness and these groups are very concerned about special designations on National Forest System lands restricting their use of these public lands.

9. Contribution to river system or basin integrity.

The watershed of the San Antonio River upstream from these segments is almost entirely within the Ventana Wilderness. The designation as a Wild and Scenic River would not add significant additional protection of the watershed than that already provided by wilderness designation.

10. Potential for water resources development.

No known proposals or existing licenses exist.

Forest Plan Alternatives

Briefly describe how a particular river was treated in each of the Forest Plan alternatives:

Alternative 1: No designation recommended for either segment.

Alternative 2: No designation recommended for either segment. No designation would protect the outstandingly remarkable heritage values by not highlighting their existence within the river corridor

Alternative 3: No designation recommended for either segment. The ORVs do not include wildlife or fisheries.

Alternative 4: No designation recommended for either segment. The ORVs do not include recreation or scenery.

Alternative 5: No designation recommended for either segment.

Alternative 6: Segment 1 would be recommended for wild designation, consistent with the existing wilderness. Segment 2 would be recommended for scenic designation due to the impoundment and improvements at Merle Ranch. The Merle Ranch area provides an opportunity for interpretation and research of the heritage resource.

Suitability Determination for the Preferred Alternative

Describe the rationale for the suitability determination of the preferred alternative:

No designation recommended for either segment. While there are outstandingly remarkable values in these segments, they can be protected by other means. The Merle Ranch has significant historic and prehistoric resources. Other avenues to protect the cultural resources should be explored and could offer better protection than designation as a Wild and Scenic River. Designation does not add any additional budget for management of the river so the protection of the cultural resources is not assured.

The ranch is also an administrative site where Forest Service pack stock are pastured. The designation of the river could have a negative impact on the use of the ranch as an administrative site. It could also restrict potential future uses of the ranch.

Upper Sespe Creek

Upper Sespe Creek Study Area Summary

Name of River: Upper Sespe Creek

Location: State of California, Ventura County, Los Padres National Forest

Upper Sespe Creek originates in the south one-half of T6N, R24W, Sec 4, SBBM and flows in a generally easterly direction. For the purpose of this study, the Sespe Creek was divided into three segments.

Segment 1: Sespe Creek is considered to be free flowing below a point in the northeast one quarter of T6N, R24W, Sec 4, SBBM, and ends at the confluence of Chorro Grande Canyon in T6N, R23W, Sec 21, SBBM. Approximately 2.8 miles of this segment flow through privately owned lands.

Segment 2: Extends from the confluence of Chorro Grande Canyon to the section line dividing T5N, R23W, Sec 1 and T5N, R22W, Sec 6, SBBM. Approximately 1.1 miles of this segment flows through privately owned lands.

Segment 3: Extends from this section line to the confluence of Rock Creek in the northwest ¼ of T5N, R22W, Sec 5, SBBM.

River Mileage:

River Segment	Miles Studied	Miles Eligible
1	9.8	0.0
2	9.5	9.5
3	2.0	2.0

Studied: 21.3 miles

Eligible: 11.5 miles

Upper Sespe Creek Eligibility Inventory

Determination of Free-flow:

The upper portion of Sespe Creek has neither past nor current diversions or impoundments.

Determination of Outstandingly Remarkable Values (ORVs):

1. Scenery

Description: Much of the length of the Sespe is scenic attractiveness class "A" landscape, within the Southwest Mountain and Valley Character type. It is distinctive not only for the presence of water, but because of the variety of landform, color, and vegetation. Most of the river flows adjacent to State Highway 33, a national Scenic Byway and California Scenic Highway.

From Chorro Grande to Sespe Gorge, Pine Mountain stands out as a dominant peak among a mix of steep slopes and broader plains. The entire area appears to be covered with a mix of chaparral. The Piedra Blanca rock outcrops dominate all views with the high color contrasts and massive scale. Water is sometimes underground and meanders through the landscape.

The gorge creates distinctive straight canyon walls, with overhanging pines as a focal point. Pools exist year-round among clusters of rock. Dramatic spring and fall colors are created in the riparian zone accentuated by the cottonwoods. The river then opens to views once again of Pine Mountain ridge and the high contrasts of the rock outcrops.

As Sespe Creek twists and turns, it acquires a wash appearance with evidence of human disturbances, vegetation more typical of the area, and a very open feel to the land. As it approaches Beaver Campground, it becomes sandier, chaparral-enclosed, and has a lasting presence of water. As it parallels the Middle Sespe Trail (Forest Trail 22W04), the wash appearance and sandy shores become evident. Finally, the river broadens again and winds through a chaparral-covered landscape.

State Scenic Highway 33 between Ozena and Ojai was designated the Jacinto Reyes National Forest Scenic Byway in 1992. The scenic designation was based on “#an amazing diversity of landscapes and habitats in a short distance. Spectacular vistas occur along the entire route yet the traveler is also treated to close encounters with beautiful cliffs, rock formations, and lush riparian areas.”

Determination: The scenic values between Chorro Grande Canyon and Rock Creek (Segments 2 and 3) are considered to be outstandingly remarkable. The distinctive and unique variety of landforms and variations of colors and the massive scale of the Piedra Blanca formations in relationship to the soft mounding chaparral stand out in high contrast to areas with similar settings. Scenic values within Segment 1 are not considered to be outstandingly remarkable.

2. Recreation:

Description: Recreation opportunities along Sespe Creek are excellent and cover a broad spectrum. Above Chorro Grande Canyon, Sespe Creek mainly runs underground and thus affords limited opportunities. Cherry Canyon Road (National Forest System Road (NFSR) 6N01) crosses this segment about midway, offering access for hiking, shooting, and four wheel driving. Access for users of the headwater portion of Sespe Creek is from the Potrero Seco Road (NFSR 6N03) along the ridge rimming the northern headwater. Private lands without any public easement block any access from Highway 33 going upstream to the headwaters. Access downstream of this road would be from the shoulder of State Highway 33.

Recreation activities below Chorro Grande Canyon include swimming and wading, picnicking, backpacking, hiking, horseback riding, bicycling, rock climbing, hunting, fishing, photography, and driving for pleasure with outstanding visual experiences. All but two miles of this segment is near State Highway 33. As a California Scenic Highway and National Forest Scenic Byway, State Highway 33 has the potential to draw visitors from throughout California and the nation. Most users are from southern California. While actual use statistics are not available, an estimated 75% of all users of this creek are from this local area. The remaining 25% (in order of importance) come from other parts of California, other states, and even other countries.

Visitors can choose among a variety of dispersed recreation opportunities as listed above. As recreation use increases on the highway, it demonstrates the willingness of visitors to travel long distances to use the river resources for recreational purposes. Interpretive exhibits are planned along the highway, and have the potential to attract visitors from outside the region. River access would be mostly from the shoulder of State Highway 33. The one exception to this would be Segment 3, which is the last two miles from Beaver Campground east where access is limited to Middle Sespe Trail and Howard Creek Road (NFSR 5N05). The Middle Sespe Trail gets light use from hikers, mountain bikers, and horseback riders.

Use is generally heaviest in the spring corresponding with high flows in the Sespe, followed by summer and fall getting about equal use. In these seasons, driving for pleasure, picnicking, and swimming are key activities along the river. Fall colors in the riparian vegetation are also important to visitors.

Determination: The recreation values above Chorro Grande Canyon (Segment 1) are not considered to be outstandingly remarkable.

Below Chorro Grande Canyon, the recreation values are considered to be outstandingly remarkable. Segments 2 and 3 offer excellent opportunities for many dispersed forms of recreation, including fishing, swimming, hiking, and horseback riding. Twelve miles of Sespe Creek are visible from the National Scenic Byway (State Highway 33). The view corridors and scenic vistas of the river canyon set amidst the stark chaparral provide unique and lively contrasts for the casual weekend drive in the mountains.

3. Geology

Description: The east-west trending Transverse Ranges include California's highest peaks south of the central Sierra Nevada and the only Precambrian rocks in the coastal mountains of the United States. The Transverse Ranges are a unique geomorphic, stratigraphic, petrologic, and structural belt 400 km long and 100 km wide that is offset by a few tens of kilometers right laterally by the northwest trending San Andreas fault system. The prominent east-west trend of the Transverse Ranges is unique among the rest of the northwest-southeast trending coastal ranges in California. It has been proposed that they have rotated significantly from their original position. Along the entire mapped length of the San Andreas Fault Zone, from northern California to Mexico, no other belt of rocks, structure, and geomorphology similar to the Transverse Range Province crosses the zone. In addition, despite their comparatively small area, the Transverse Ranges seem to incorporate a greater spectrum of rock types and structure than any other province in the state. The Transverse Ranges may be the result of compressional forces along the Big Bend in the San Andreas Fault that itself is a unique geologic feature in North America if not the world.

Upper Sespe Creek occupies an east-west trending valley in the Transverse Ranges. The valley was formed by downfaulting along the Pine Mountain Fault and this has allowed a good sequence of Tertiary, Oligocene, and Miocene rocks to be preserved. Upper Sespe Creek cuts through Tertiary sedimentary rocks of the Cozy Dell Shale, Matilija Sandstone, and the Juncal Shale before cutting across Munson Creek Fault. This fault is a high-angle reverse fault with several thousand feet of displacement. The south side has been displaced up relative to the north side. The creek then continues in Tertiary sedimentary rocks of the Juncal and Matilija formations. Where the creek passes through the Matilija Sandstone, it forms a steep-walled narrow canyon called Sespe Gorge. The Matilija Formation is folded in a syncline through this gorge. Downstream, the creek passes through

an arkosic member of the Cozy Dell formation, the Coldwater Sandstone and shale. The creek also crosses the Tule Creek Fault near Hartman Ranch. This fault also displays several thousand feet of vertical displacement with the south side up relative to the north side. Both the Munson Creek and Tule Creek Faults are between two major faults of the Transverse Ranges: the Santa Ynez and Pine Mountain Faults. At Tule Creek, upper Sespe Creek makes a right angle turn to the east and follows the trace of Tule Creek Fault for approximately 1.5 miles. The creek primarily follows the fault through the Cozy Dell formation to the confluence of Piedra Blanca Creek.

Determination: The sedimentary rock formations and structural features associated with the Tule and Munson Creek Faults and the synclinal folds in the Matilija Sandstone are not considered to be outstandingly remarkable in comparison with similar features located elsewhere in this geologic province.

4. Fish and Wildlife

Description: Sespe Creek contains suitable habitat for several federally listed endangered, threatened, rare or Forest Service sensitive species. Species that inhabit Sespe Creek include arroyo toad (*Bufo californicus*), California condor *(Gymnogyps californians)*, southwestern pond turtle (*Clemmys marmorata pallida*), and two-striped garter snake *(Thamnophis hammondii)*.

Sespe Creek historically supported anadromous runs of the endangered California southern steelhead (evolutionary significant unit *Oncorhynchus mykiss*), and currently provides habitat to native stocks of rainbow trout, arroyo chub, and three-spined sticklebacks. Non-native fish species have recently invaded and occupied Sespe Creek. These species include the green sunfish, bass, and black bullhead catfish.

The riparian corridor of Sespe Creek provides habitat for a variety of neo-tropical migratory birds and federally listed endangered southwestern willow flycatcher *(Empidonax traillii extimus)*. It may contain potential habitat for the federally listed endangered least Bell's vireo *(Vireo bellii pusillu)*.

Small numbers of steelhead trout still utilize Sespe Creek for spawning and rearing habitat within the Los Padres National Forest and within the designated segments of the stream.

A minor amount of recreational impacts occur from hiking, fishing and equestrian uses along the Middle Sespe Trail. With the exception is its crossing of Sespe Creek at Beaver Campground, most of this trail is located on higher ground well north of Sespe Creek.

Arroyo toads, a federally listed endangered species, are found within this portion of Sespe Creek in scattered habitat downstream from Tule Creek. The creek includes approximately 25 miles of modeled and suitable habitat for the species. Impacts occur to toads at Lion Campground from recreational uses. This site has been seasonally closed over the past six years and closed virtually year round the past two years in response to Section 7 requirements. This site is downstream of the study river.

The California red-legged frog *(Rana aurora draytonji)*, a federally listed threatened species, historically occurred along Sespe Creek but appear to have been extirpated by predation of exotic bullfrogs and warm water fish species. The entire length of river lies within designated critical habitat.

Modeled habitat for least Bell's vireo and southwestern willow flycatcher, both federally listed as endangered, exists along Sespe Creek; however, no recent occupancy of least Bell's vireo has been documented. There have been several sightings of the more common willow flycatcher, a Forest Service sensitive species. Sespe Creek contains potential cliffside nesting habitat for the peregrine falcon *(Falco peregrinus)*, a Forest Service sensitive species.

The southwestern pond turtle, a federally listed rare and Forest Service sensitive species, and the two-striped garter snake, a Forest Service sensitive species, are found scattered throughout the drainage.

Determination: Sespe Creek includes approximately 25 miles of suitable habitat for arroyo toads. The resident population of arroyo toads in segments 1 and 2 is one of the largest within one hundred miles, and since the geographical range of this meta-population contains gaps, this is outstandingly remarkable. Sespe Creek contains steelhead trout spawning habitat important for the recovery and propagation of the federally endangered southern California evolutionarily significant unit. Approximately 36 miles of potential habitat exists. There have been several southwestern willow flycatcher sightings (Forest Service sensitive) within the drainage. Intact habitat for southern steelhead and southwestern willow flycatcher habitat is also outstandingly remarkable, because samples of this intact habitat are very rare on the Los Padres National Forest and in the southern California Province.

5. Heritage resources (Cultural)

Description: A portion of the width of the corridor along the eastern end has been inventoried; in general, only a small portion of the corridor has been inventoried. Nonetheless, numerous sites are known for this study area.

Several prehistoric sites are known; subsurface testing would be required to assess their significance. Some of the sites might prove to offer important information regarding the ancestral Ventureno Chumash.

Determination: Heritage values are not considered to be outstandingly remarkable.

Future research may well demonstrate high scientific or other values for sites within this corridor. A question needing further investigation is that of the nature of potential connections between these sites and impressive rock art sites that are within the Upper Sespe drainage but that are outside the river study area. Current information is unfortunately insufficient to allow the identification of any outstandingly remarkable values within the study area.

6. Heritage resources (Historic)

Description: A portion of the width of the corridor along the eastern end has been inventoried; in general, only a small portion of the corridor has been inventoried. Nonetheless, numerous sites are known for this study area.

Regarding historic resources, a homestead site is present but has had its integrity compromised by removal of the cabin. One of two adobe sites, the Ortega Adobe (possibly built in the 1880's or 1890's) has similarly had its integrity diminished by destruction of the building. The significance of the Potrero Seco Adobe (built in 1890) is unknown and needs more complete recording.

Determination: Heritage values are not considered to be outstandingly remarkable.

Future research may well demonstrate high scientific or other values for sites within this corridor. A question needing further investigation is that of the nature of potential connections between these sites and impressive rock art sites that are within the Upper Sespe drainage but that are outside the river study area. Current information is unfortunately insufficient to allow the identification of any outstandingly remarkable values within the study area.

7. Other (Botany)

Description: The botanical resources of the Upper Sespe Creek are fairly well known due to the creek's proximity to road and trail; however, no systematic effort has been made to inventory the botanical resources found in the study corridor.

Based on a review of existing literature, there are no known occurrences of endangered, threatened, proposed, candidate, or sensitive plant species within one-quarter mile of the upper Sespe Creek. There are a number of occurrences of sensitive plant species in the upper Sespe Creek watershed but these populations all occur more than one mile from the creek.

Determination: Although there is a sensitive plant occurrence within the study corridor, it is not considered to be an outstandingly remarkable botanical feature because of the small proportion of the plant population within the study corridor and the association of the species with upland habitat types.

Summary of Outstandingly Remarkable Values:

Scenery

Sespe Creek in segments 2 and 3 has notable and exemplary visual features that include contrasts created by large rock outcroppings and seasonal colors in combination with water that attracts regional and national attention. This is supported by the National Forest Scenic Byway designation.

Recreation

Below Chorro Grande Canyon, Sespe Creek has outstandingly remarkable recreation values. It offers excellent dispersed recreation opportunities including driving for pleasure and viewing scenery on the adjacent Scenic Byway. Much of the recreation occurring is water-oriented along Sespe Creek. The recreation experiences are accentuated by the natural scenic surroundings.

Fish and Wildlife

The resident population of arroyo toads in the segments 1 and 2 of Sespe Creek is one of the largest within one hundred miles, and since the geographical range of this meta-population contains gaps, this is outstandingly

remarkable. Intact habitat for southern steelhead and southwestern willow flycatcher habitat is also outstandingly remarkable, because samples of this intact habitat are very rare on the Los Padres National Forest and in the southern California National Forests.

Potential Classification

See table 444: Upper Sespe Creek - Potential Classification by River Segment.

Upper Sespe Creek Suitability Report

Description

Landownership and Land Uses

Segment 2: Extends from the confluence of Chorro Grande Canyon to the western boundary of T5N, R22W, Sec 6 (approximately one-half mile east of Beaver Camp). Approximately 1.1 miles of this segment flows through non-federal lands.

Segment 3: Extends from this section line to the confluence of Rock Creek in the northwest ¼ of T5N, R22W, Sec 5.

River mile location is from the source (see table 450: Upper Sespe Creek - Segment Description).

The land use on the private parcels is unlikely to change from the current rural atmosphere. This is due in part to the fact that these properties are not part of the southern California electricity grid. The closest urban utilities are 20 miles away.

Mineral and Energy Resource Activities

There are no existing mineral uses or potential for future mineral development in the vicinity of the river corridor. Minor evidence of exploratory mining that occurred up to the 1960's can still be seen in Potrero John Canyon and Tule Creek; mining activity in the corridor has been absent since that time.

Water Resources Development

There is no potential for the river to be used for either hydropower or water diversion in this reach. In the 1970's, dam construction was proposed near Howard Creek. This proposal was never realized. If proposed today, it would not be approved due to the fact that a water transmission pipeline would not be allowed through the Sespe Wilderness or by tunneling through the mountains to Ojai. The management of the numerous endangered species in this area would preclude the possibility of diverting creek water.

Transportation, Facilities and Other Developments

The upper portion of segment 2 meanders through private property for approximately one mile. The entire segment parallels State Highway 33 for the remaining eight miles to the boundary between segments 2 and 3. State Highway 33 is designated as a National Forest Scenic Byway with numerous turnouts that provide vistas of the Sespe Creek corridor. Highway 33 was constructed in the 1930's to provide an important link for commerce and recreation between the San Joaquin Valley and the south-central coast of California. It continues today to provide this same important link. This currently includes semi-trucks hauling gravel from inland valleys to the coastal urban areas.

Potrero John Trailhead (for Forest Trail 23W06) is located along State Highway 33 between Chorro Grande and Sespe Gorge. The trail traverses the corridor in a northerly direction and crosses Potrero John Creek several times in its 1.6-mile length.

The Middle Sespe Trailhead is in the lower portion of segment 2 at Beaver Campground along State Highway 33. The Middle Sespe Trail (Forest Trail 22W04) crosses the creek once and then parallels the creek on the north bank within the corridor for 4 miles. Several social trails to swimming holes are evident.

The northern terminus of the Howard Creek Road (NFSR 5N05) is located in segment 3 of the river corridor. There is a five-acre private parcel that is mostly within the designated Wild and Scenic River corridor. The western portion of this parcel is within the southeastern boundary of the study river corridor. This road is gated south of the corridor. This keeps public vehicle traffic out of the corridor. The public is allowed access beyond

the gate on foot, horseback, or mountain bike. The property owners have special use permits authorizing the following on National Forest System land: water transmission pipeline, driveway, and gate. The owners provide maintenance on the entire length of Howard Creek Road through an agreement with the Forest Service. Howard Creek Campground was located at the end of Howard Creek Road. It was closed in 1978 after heavy winter flooding damaged the campground beyond repair.

Recreation Activities

Recreation opportunities along Sespe Creek are excellent and cover a broad spectrum. Recreation activities below Chorro Grande Canyon include swimming and wading, picnicking, backpacking, hiking, horseback riding, bicycling, rock climbing, hunting, photography, and driving for pleasure with outstanding visual experiences. All but two miles of this segment are near State Highway 33. As a California Scenic Highway and National Forest Scenic Byway, State Highway 33 has the potential to draw visitors from throughout California and the nation. Most users are from southern California. While actual use statistics are not available, an estimated 75% of all users of this creek are from this local area. The remaining 25% (in order of importance) come from other parts of California, other states, and even other countries.

Visitors can choose among a variety of dispersed recreation opportunities as listed above. As recreation use increases on the highway, it demonstrates the willingness of visitors to travel long distances to use the creek's resources for recreational purposes. Interpretive exhibits are planned along the highway, and have the potential to attract visitors from outside the region. Creek access is mostly from the shoulder of State Highway 33. The one exception to this would be segment 3, which is the last two miles from Beaver Campground east where access is limited to Middle Sespe Trail and Howard Creek Road. The Middle Sespe Trail gets light use from hikers, mountain bikers, and horseback riders. Beaver Campground is the only existing campground in the corridor; it has 11 campsites. The campground is an acceptable use within the classification criteria for a recreation river segment. However, it is currently being evaluated for user conflicts with endangered species.

Use is generally heaviest in the spring corresponding with high flows in Sespe Creek, followed by summer and fall getting about equal use. In these seasons, driving for pleasure, picnicking, and swimming are key activities along the creek. Fall colors in the riparian vegetation are an aesthetically pleasing attribute along segments 2 and 3 of the river corridor.

Other Resource Activities

Other than the small family gardens found on the private parcels, there is very little potential for this portion of the Sespe Creek corridor to have uses other than recreation in the foreseeable future. A stream gauge designed to measure the flow of the river during flood events is located in the Sespe Gorge area. This structure is permitted to the U.S. Geological Survey and operated by the Ventura County Watershed Protection District. It is likely that the use of this gauge may be phased out in the near future. There is no timber harvesting or livestock grazing occurring along these segments. There is a minimal amount of livestock grazing occurring on a few private parcels upstream. Due to its remoteness, the area is not on the southern California electricity grid; this currently tends to limit the types of activities for other resources.

Special Designations

The Sespe Wilderness borders the north side of the corridor near Howard Creek and also near Potrero John Trail. The intent of enabling legislation is to protect these lands in their primitive condition, and to allow no development or motorized/mechanized access. This same legislation designated the downstream portion of Sespe Creek as a Wild and Scenic River starting at Howard Creek.

Highway 33 is designated as a National Forest Scenic Byway. This designation is given to deserving routes in the National Forest that exhibit outstanding scenery. A management plan is currently being developed for this Scenic Byway.

All of these designations are complimentary to, and do not conflict with, studying the suitability of Sespe Creek for inclusion in the Wild and Scenic River system.

Socio-Economic Environment

Ojai (population 8,000) is the closest town (25 miles). The economy of Ojai Valley is based on agriculture and tourism. The immediate area is not growing rapidly due to open space zoning. The Highway 33 corridor receives steady year-round use. The majority of the traffic is passing through the Forest. Use in segment 2 is limited to

non-motorized access. Designation as a Wild and Scenic River would have a minimal impact on use patterns. If segment 1 is included in any designation, there is a potential small-scale impact due to acquisition of private parcels if willing sellers exist. This would create a minimum impact on the county property tax base.

Current Administration and Funding Needs if Designated

	Expenses Independent of Designation	Additional Expenses with Designation
General Administration *	**$15,000**	**$13,400**
Development of River Management Plan	**$0**	**$60,000**
Development Costs	**$0**	**$2,000**
Operation and Maintenance Costs	**$75,000**	**$5,000**
Total Cost First Five Years	**$90,000**	**$80,400**

*General administration and operation and maintenance costs are estimated to continue at $16,000 annually.

Suitability Factor Assessment:

1. Characteristics that do or do not make the area a worthy addition to the National System.

Worthy: Characteristics that make it a worthy addition include its predominantly undeveloped character in a rural setting and the fact that it flows unimpeded to the ocean. It is also steelhead habitat and contains other riparian threatened, endangered, and sensitive species, making it rich in biodiversity. For approximately 8 miles in segment 2, the Sespe Creek parallels State Highway 33, which is both a National Forest Scenic Byway and State Scenic Highway. The presence of Sespe Creek played a key role in these two designations. This proposed addition would also be contiguous with the existing segment of Sespe Creek that is already designated as a scenic river.

Not worthy: Characteristics that make it not a worthy addition include moderate amounts of large semi-truck traffic, principally on weekdays. Also, the large landslide along Highway 33 near Tule Creek represents a source for sedimentation into Sespe Creek as well as a visual scar. However, this does represent a prime spot for geologic interpretation. The slide face is being revegetated both naturally and through plantings by CalTrans. Finally, the developments on private land inholdings at Faser Cold Springs downstream of the landslide and between Munson and Chorro Grande Creeks are detractions. Although no large structures are present, these lands are in contrast with the generally undeveloped nature of the creek.

2. The current status of land ownership and use in the area.

With few exceptions, lands in the area are National Forest System lands. On the private land parcels, there is a limited amount of agriculture occurring. There is also the potential of artificial riprap being swept away down river from the riparian area of private land at Faser Cold Springs. California Department of Transportation (CalTrans) has a special use permit for Highway 33 that is 132 feet wide. A separate permit allows them to use and maintain the ‘sand shed’ above Tule Creek for storage of sand and gravel for spreading on the highway during the winter. Collectively, these uses can be managed in accordance with management of Sespe Creek under the Wild and Scenic Rivers Act.

3. The reasonably foreseeable potential uses of the land and water that would be enhanced, foreclosed, or curtailed if the area were included in the System.

Portions of the river are under two federal power withdrawal projects. The Federal Energy Regulatory Commission (FERC) has recommended that projects (#64 and 414) be terminated. They are currently involved in the litigation brought by the National Wildlife Federation. Due to the surrounding wilderness area and the multiple species listed as threatened, endangered, or sensitive, it is unlikely that any project proposed in the future

would be approved.

4. The federal agency that will administer the area, should it be added to the System.

The USDA Forest Service would be the federal agency that will administer the area, should it be added to the System. Sespe Creek is in the Los Padres National Forest on National Forest System lands.

5. The extent to which the agency proposes that administration of the river, including the costs thereof, be shared by State and local agencies.

As Highway 33 is immediately adjacent to Sespe Creek, management of the highway in essence becomes management of the creek in most locations. The Forest Service plans to apply for ISTEA grant funding through CalTrans. If funded, these proposals would include development of brochures, signs, and other interpretive material along the Scenic Byway/Wild and Scenic River corridor. In addition, there is coordination and planning involved with CalTrans over their management of Highway 33 alongside Sespe Creek.

6. The estimated cost to the United States of acquiring necessary lands and interests in land and of administering the area, should it be added to the system.

The best parcel to acquire is Faser Cold Springs as an administrative site. Acquisition costs would be an estimated $500,000. In addition, operation and maintenance costs would be contingent upon its future use.

7. A determination of the degree to which the State or its political subdivisions might participate in the preservation and administration of the river, should it be proposed for inclusion in the System.

As the river corridor is in a remote area, it is expected that the State of California and Ventura County would participate to a very slight degree in the preservation and administration of the river, should it be proposed for inclusion in the System. However, it is also expected that the State of California would welcome the inclusion, as it is complimentary to the State Scenic Highway designation for Highway 33. Any participation by State or county agencies would be done as economically as possible in light of current budget constraints.

8. State and/or Local government's ability to manage and protect the outstandingly remarkable values on non-federal lands.

CalTrans manages State Highway 33 on National Forest System lands under permit from the USDA Forest Service. On the several parcels of private land, CalTrans holds easements for Highway 33. As these easements are old, they likely do not contain language specifically related to protection of outstandingly remarkable values on these non-federal lands. However, CalTrans has operating policies and procedures that would amount to protection of these values.

Ventura County would be able to protect outstandingly remarkable values by retaining the existing zoning regulations in the area. These laws have set a "tone" of lightly developed, rustic private parcels interspersed within the National Forest System lands.

9. The consistency of designation with other agency plans, programs or policies.

Designation of Sespe Creek would be consistent with other plans and activities. It would be consistent with the current Los Padres Land and Resource Management Plan. It is consistent with Cal Trans' plans for highway maintenance. There are no known plans by Ventura County, U.S. Fish and Wildlife Service, or any other agency that are inconsistent with this possible designation. The one exception to this is a proposal by CalTrans to add a communication site along Highway 33 to assist their radio communication system.

10. Support or opposition to designation.

Support for designation is from Keep the Sespe Wild Committee and Friends of the River. Opposition would be anticipated from a large segment of forest users who have expressed an opposition to special land use designations. It would appear that the results of our public meetings for Forest Plan Revision indicate a majority of users like the status quo.

11. Contribution to river system or basin integrity.

Designation of the proposed segments of Sespe Creek would protect an additional long segment of steelhead habitat as well as adding to the basin integrity already afforded by the existing designation of 31.5 miles of Sespe Creek immediately downstream of the study segment. This is modeled steelhead habitat that may be a contributor to species recovery. These segments of Sespe Creek are entirely outside the wilderness and may add an additional

level of habitat protection for steelhead. Designation would add to river basin integrity by adding a significant segment that would result in protections along Sespe Creek from its upper reaches to near its confluence with Santa Clara River that leads to the Pacific Ocean.

12. Potential for water resources development.

Historically, Sespe Creek has been studied for water resources development. This issue became one of the reasons that the Sespe Wilderness was created. For many years, United Water Conservation District studied Sespe Creek for possible construction of water impoundments. There were also projects No. 64 and No. 414 done by FERC. At this time and into the foreseeable future, any requests for water resources development would be denied based either on effects on Sespe Wilderness or endangered species.

13. Contribution to other regional objectives/needs.

An interagency consortium has a long-term regional objective of the improvement of steelhead and arroyo toad habitat. Designation of Sespe Creek would aid in this important project. Agencies included are California Department of Fish and Game, U.S. Fish and Wildlife Service, NOAA Fish, and USDA Forest Service.

Forest Plan Alternatives

Briefly describe how a particular river was treated in each of the Forest Plan alternatives:

Alternative 1: No segments are recommended for designation.

Alternative 2: Segment 2 is recommended for recreational river designation. Segment 3 is recommended for scenic river designation. Segments 2 and 3 have scenery and recreation as ORVs. Due to the presence of State Highway 33 within the river corridor, segment 2 is classified as recreation. Segment 3 contains an improved dirt road and a private parcel with improvements and is classified as scenic.

Alternative 3: Segment 2 is recommended for recreational river designation. Segment 3 is recommended for scenic river designation. Upper Sespe Creek has wildlife and fisheries as ORVs. Due to the presence of State Highway 33 within the river corridor, segment 2 is classified as recreation. Segment 3 contains an improved dirt road and a private parcel with improvements and is classified as scenic. This recommendation balances the need to protect and enhance the free-flowing character, water quality and outstandingly remarkable values with the conservation of a wide range of wildlife and plant species (especially TES) and habitats, biodiversity, linkages and corridors.

Alternative 4: Segment 2 is recommended for recreational river designation. Segment 3 is recommended for scenic river designation. Segments 2 and 3 have scenery and recreation as ORVs. Recommended rivers have recreation and/or scenery as outstandingly remarkable values. Due to the presence of State Highway 33 within the river corridor, segment 2 is classified as recreation. Segment 3 contains an improved dirt road and a private parcel with improvements and is classified as scenic.

Alternative 5: No segments are recommended for designation.

Alternative 6: Segment 2 is recommended for recreational river designation. Segment 3 is recommended for scenic river designation. Due to the presence of State Highway 33 within the river corridor, segment 2 is classified as recreation. Segment 3 contains an improved dirt road and a private parcel with improvements and is classified as scenic. This recommendation protects and enhances a wide range of values and features, including species conservation, biodiversity, open space, natural beauty, recreation and research.

Suitability Determination for the Preferred Alternative

Describe the rationale for the suitability determination of the preferred alternative:

Segment 2 is recommended for recreational river designation. Segment 3 is recommended for scenic river designation. This recommendation best meets the intent of the Wild and Scenic Rivers Act and best protects the outstandingly remarkable values identified in these segments. The two river segments are worthy of designation in the Wild and Scenic River System. They have scenery, recreation, and wildlife as outstandingly remarkable values. This recommendation also adds a little more emphasis to riparian and endangered species protection in addition to what already exists. Finally, this recommendation adds to a unique remaining ecosystem in southern California.

This alternative represents a shorter portion of Sespe Creek being potentially designated. The character of the

excluded creek channel changes from Munson Creek up to Chorro Grande, in that it is more open and less impressive visually. The additional factor for selecting this alternative is that the excluded segment contains several private parcels of land that contain structures and are potentially non-conforming. Funding for acquiring these parcels (if the seller were willing) is a low priority compared with areas near the Ventura River that are closer to Ojai and have the greatest potential for development. In contrast, the parcels on the Sespe have no electricity and are primitive, making them a low priority for development and acquisition funding.

This alternative also shares a common boundary with an existing long segment of designated Wild and Scenic River on Sespe Creek. The lengthening of the Wild and Scenic River designation represented by this alternative and existing segment is a quality addition to the Wild and Scenic River System.

Appendix F. Research Natural Areas

Research Natural Areas Background and Status

Research Natural Areas (RNAs) are part of a national network of ecological units set aside primarily for research and education and secondarily for the preservation of biological diversity. They provide opportunities for non-manipulative, non-destructive research, long-term monitoring, and other educational activities. Because they are protected in a natural state, RNAs are particularly valuable for monitoring long-term ecological change as well as serving as control areas against which the short- and long-term effects of resource management can be compared.

By encompassing a wide range of ecological types, RNAs also provide habitat for less well-known elements of the biodiversity such as insects, fungi, mosses, lichens and soil organisms. In short, RNAs serve as repositories for biodiversity that safeguard habitats, species, and natural processes. Recommendations and analyses of candidate RNAs (cRNAs) are presented in this document. Depending on the selected alternative, new RNAs likely will emerge from this plan revision.

Research Natural Areas are selected to:

- Preserve a spectrum of unmodified areas that represent both common and unique vegetation types.
- Contribute to a national network of ecological areas set aside for research, education, and the preservation of biodiversity.
- Serve as baseline areas for monitoring long-term ecological changes such as succession and the effects of global climate change.
- Serve as control areas for comparing the effects of resource management activities in similar ecosystems.
- Serve as sites for conducting non-destructive research.
- Provide opportunities for educational activities.
- Preserve genetic diversity.

Currently there are 14 established Research Natural Areas on the forests (see table 322: Established RNAs on the southern California National Forests) totaling 14,330 acres. These areas capture an array of both common and unique vegetation types on the four forests.

Although the first Forest Plans identified a number of cRNAs, for a variety of reasons not all were established. As a result, they are being carried forward into this analysis, along with a number of new cRNAs that have been identified since the completion of the first Forest Plans (see table 323: Candidate RNAs on the four southern California National Forests). A number of cRNAs have establishment records prepared for them so that if they appear in the selected alternative, they will automatically become established. New cRNAs that appear in the selected alternative, but lack ecological surveys and/or establishment records, will become eligible for inclusion in the RNA system.

Descriptions of these areas and summaries of their special values can be found in Forest Plan Part 2 - Appendix A.

Recommended Research Natural Areas by Alternative

Alternative 6 recommends carrying forward the greatest number cRNAs, 15 areas totaling 32,100 acres, and would therefore make the greatest contribution to the Region 5 and national RNA network. Alternative 3

recommends the next highest number of new RNAs, 14 encompassing 29,876 acres, and alternative 2 proposes 12 with 28,798 acres. Alternative 4 recommends five areas at 11,141 acres. Alternative 1 recommends four areas at 9,037 acres, and alternative 5 recommends only one new RNA with 2,220 acres.

Although Cobblestone Mountain and White Mountain cRNAs on LPNF are both included in this analysis, only one will be selected to represent the bigcone Douglas-fir target element. Selection of the best area will depend on the results of a field reconnaissance. Because the two areas differ in size by only 110 acres, the smaller area, White Mountain, is used in the calculations of total area recommended in each alternative.

Following are the RNA alternative comparison tables:

- Table 318: Cleveland National Forest Candidate Research Natural Areas Recommended By Alternative
- Table 319: Los Padres National Forest Candidate Research Natural Areas Recommended By Alternative
- Table 320: San Bernardino National Forest Candidate Research Natural Areas Recommended By Alternative
- Table 321: Summary of Candidate Research Natural Areas Recommended By Alternative

No cRNAs were identified for the ANF in this round of planning.

The Forest Service Manual describes activities that are generally not allowed within RNAs. All alternatives would prohibit these activities in established and cRNAs, except where one or more (e.g. grazing, prescription fire) is needed to maintain certain vegetation types. In the initial screening process for cRNAs, current and future management options for each area were considered. This screening removed from further consideration areas where significant conflicts with existing management were identified.

Appendix G. Special Interest Areas

Special Interest Areas Background and Status

Background. Special Interest Areas (SIA) may be designated by the Regional Forester to protect and manage for public use and enjoyment those special recreation areas with scenic, geological, botanical, zoological, paleontological, archaeological, or other special characteristics or unique values. They may include the protection and management of threatened, endangered, or sensitive species and other elements of biological diversity; recreation or cultural significance; or historic importance. The size of individual special interest areas varies depending on the site-specific resource values and management emphasis. SIA management focuses on allowing natural conditions to prevail as long as they do not threaten resources, public safety, and properties outside the SIA boundary. Habitat or vegetation management manipulation is permitted to more closely approximate (or restore) natural conditions and processes or for protection of threatened, endangered or sensitive species. Unlike Research Natural Areas or Experimental Forests, the Forest Service encourages public use and enjoyment of each administratively designated SIA up to the level that will ensure protection of the special values for which the area was established. A management plan is written and interpretive services to enhance the visitor's understanding and appreciation of the area's special features are offered. Occupancy and use of the area's resources are allowed to the extent they neither interfere with the primary values for which the area was established nor negatively affect the visitor's experience.

Status. There are 15 Special Interest Areas established by the original land management plans or earlier (see table 338: Established Special Interest Areas). Twenty-seven additional areas with special and unique resources are proposed for designation under some alternatives:

- Table 339: Angeles National Forest Candidate Special Interest Areas
- Table 340: Cleveland National Forest Candidate Special Interest Areas
- Table 341: Los Padres National Forest Candidate Special Interest Areas
- Table 342: San Bernardino National Forest Candidate Special Interest Areas

Some SIAs have overly dense forest stands due to past fire suppression and fire exclusion. Also, recent drought conditions and bark beetle epidemics has led to high levels of tree mortality, especially in the San Bernardino, San Jacinto, Santa Rosa and Palomar Mountains. Some of the candidate SIAs are located within this drought-stricken area, including most of those on the San Bernardino National Forest. There are known insect and/or disease problems in some of the candidate SIAs at this time, including all within the drought-stricken San Bernardino National Forest. Exotic plant and animal life is a problem in some candidate SIAs. Most candidate SIAs have documented occurrences of natural fire. Prescribed fire may be permitted to mimic a natural fire regime or to reduce unnatural fuel loads, except where such burning would threaten other values for which the SIA was proposed.

Some SIAs are located near, adjacent to or within a designated or candidate wilderness, wild and scenic river, or research natural areas. For example, a portion of the candidate Deep Creek SIA overlaps with the candidate Deep Creek Wild and Scenic River. Wilderness, wild and scenic river and research natural area and SIA management are usually compatible since both emphasize allowing natural conditions to prevail.

Although mining is a permitted use in SIAs, there has been little minerals-related activity in the candidate SIAs. Oil and gas leasing is minimal since the candidate SIAs are within areas that have been identified as having no or low potential for oil and gas development.

Livestock grazing exists in some candidate SIAs, most notably Garner Valley. This use would be allowed to continue as long as the use does not become a threat to the values for which the SIA was proposed.

The Forest Service specifically manages and markets SIAs for public use, enjoyment and education. During the

initial screening process, levels and types of recreation use were reviewed for each candidate SIA to ensure that current and expected future uses were within the allowable levels and compatible with the goals of SIA management.

A full description of these areas and their special values can be found in the land management plans part 2 - Appendix A, Special Designation Overlays for each forest.

Recommended Special Interest Areas by Alternative

Special Interest Areas are protected and managed to maintain the unique features that lead to their designation and for public use and enjoyment. The following tables display the acres (by forest and alternative) included in each proposed SIA:

- Table 337: Summary of Candidate Special Interest Areas Recommended By Alternative
- Table 451: Angeles National Forest Candidate Special Interest Areas by Alternative
- Table 452: Cleveland National Forest Candidate Special Interest Areas by Alternative
- Table 453: Los Padres National Forest Candidate Special Interest Areas by Alternative
- Table 454: San Bernardino National Forest Candidate Special Interest Areas by Alternative

Alternatives 3 and 6 provide for the widest variety of new SIAs and types. Alternatives 2 and 4 propose a few additional SIAs and alternatives 1 and 5 propose no new SIAs. No alternative recommends a reduction in size or the elimination of any existing SIAs.

Special Interest Areas will be managed according to a management plan written for them after they are designated. The land management plan revision may also place some constraints on activities and uses within SIAs to protect them from direct effects of certain management activities. Activities and use would be allowed to the extent they neither interfere with the primary values for which the area was established nor negatively affect the visitor's experience. Therefore, each SIA would be managed somewhat differently and receive varying direct and indirect effects from each resource values. Human manipulation may be employed to maintain the ecosystem or unique features for which the SIA was established or to re-establish more natural ecological processes. Vegetation, habitat, soil productivity, water quality, and ecological processes will remain in a relatively natural condition. An emphasis is often placed on public information, interpretation and education. During the initial candidate SIA screening process, future management options for each area were considered. This initial screening process removed from further consideration areas where significant conflicts with existing management were identified. Some of the changes that occur in SIAs would result from natural disturbance events such as fire, insects and disease.

Appendix H. Santa Rosa and San Jacinto Mountains National Monument

National Monument Background and Status

National Monuments are areas created by law that have unique ecological, geologic, historical, prehistorical, cultural and scientific interest. The Santa Rosa and San Jacinto Mountains National Monument (SRSJMNM) was established in the Act of October 24, 2000. This Public Law 106-351 webpage link is: http://www.ca.blm.gov/pdfs/palmsprings_pdfs/PL_106-351.pdf.

The Act created a 271,400 acre National Monument, encompassing 89,500 acres of Department of Interior, Bureau of Land Management (BLM) lands, 65,000 acres of Department of Agriculture, Forest Service lands, 19,800 acres of Agua Caliente Band of Cahuilla Indians lands, 12,900 acres of California Department of Parks and Recreation lands, 28,900 acres of California Department of Fish and Game lands, 7,500 acres of other State of California agencies lands, and 38,500 acres of private land. As the only land management designation of this type in the southern California National Forests, the Santa Rosa and San Jacinto Mountains National Monument is nationally significant.

This bipartisan legislation established the first congressionally designated National Monument and the first monument to be jointly managed by the BLM and the Forest Service. It affects only federal lands and Federal interests located within the established boundaries. The BLM and the Forest Service jointly manage these federal lands within the National Monument in consultation and cooperation with the Agua Caliente Band of Cahuilla Indians, other federal agencies, State agencies and local governments to protect this National Monument's biological, cultural, recreational, geological, educational, scientific, and scenic values.

The Santa Rosa and San Jacinto Mountains National Monument is located in southern California, approximately 100 miles east of Los Angeles with a dramatic landscape rising abruptly from near sea level in the valley to the San Jacinto Peak at 10,834 feet. Five distinct "life zones," from Sonoran Desert to Arctic Alpine provide exceptionally diverse biological resources and nationally important landscapes and resources. The boundary runs northwest to southeast along the edge of the Coachella Valley, a broad, low elevation valley comprising the westernmost limits of the Sonoran Desert. Nine cities, (Palm Springs, Cathedral City, Rancho Mirage, Indian Wells, Palm Desert, La Quinta, Indio, Coachella and Desert Hot Springs) lie within this valley--an area of rapid growth and increasing urbanization. The SRSJMNM provides a picturesque backdrop and an abundance of recreational opportunities that are important regional economic resources for the Coachella Valley and mountain communities.

Current and potential important issues in the Monument mirror some of the key issues in the forest plan revision and include forest health and fire management and anticipated increased recreation demand. The current drought and stand density condition has led to extensive conifer forest mortality within portions of the higher elevations of the SRSJMNM. Wildfires (usually human-caused) occasionally burn through these mountains. The primary management action for wildfire is suppression, which has partially led to vegetation conditions different from those resulting from natural processes. Fuel buildups are now high in several areas, which may increase the potential of severe fires there. Vegetation type-conversion is also a concern in places. The SRSJMNM does not have a wildland fire management plan that would allow wildfire to play a more natural role. In addition, increased visitation to the SRSJMNM now that it has been designated a National Monument may occur. This would create some management challenges, especially providing adequate recreational opportunities while balancing the need for natural and cultural resource protection. A strong conservation education program would help address these concerns.

The presence of the SRSJMNM helps to provide a major public land base in rapidly urbanizing southern California. Therefore, retention of the SRSJMNM ensures both public enjoyment and continued protection and maintenance of natural and cultural resource protection. Natural disturbance processes will be a factor in many of

the changes that occur within the National Forest System lands within the SRSJMNM, as much of this land base is designated wilderness. The Monument legislation specifies that most uses and activities currently occurring there will continue.

The management plan for the SRSJMNM provides strategic and operational guidance and is tiered to the land management plan revision. A local advisory board was chartered to help prepare and implement the Monument Management Plan, ensuring continued grassroots interest, support and involvement. The link to the Environmental Impact Statement and management plan is: http://www.ca.blm.gov/palmsprings/santarosa/management_plan.html.

No additional National Monuments are being proposed in the land management plan revision; nor is any reduction in size or elimination of the existing SRSJMNM. Because direction for this Monument is detailed in law, regulation, agency policy and in a specific management plan, administration will not vary by alternative.

Appendix I. Oil and Gas Potential

ANGELES, CLEVELAND AND SAN BERNARDINO NATIONAL FORESTS

OIL AND GAS POTENTIAL

REASONABLE FORESEEABLE DEVELOPMENT SCENARIO

Prepared by The United States Department of Agriculture

Forest Service

Region 5-California

S. California Province

With the assistance of

The United States Department of the Interior

Bureau of Land Management

California State Office

Bakersfield Field Office

I. Background

II. Regulatory Framework

III. Geologic Setting

IV. Mineral Potential

V. Estimated Effects of Leasing

VI. Conclusions

Attachment – Ventura Basin Province (013)

I. Background

The four southern California forests, the Angeles National Forest (ANF), the Cleveland National Forest (CNF), Los Padres National Forest (LPNF) and the San Bernardino National Forest (SBNF), are undergoing a revision of their land and resource management plans. Planning for mineral resource management is an integral part of a successful forest plan. Mineral exploration and development is driven by natural settings, such as the location of favorable geologic formations, and supply-demand market economics.

Existing land and resource management plans (LMP), for the four S. California forests, completed between 1986-1989, did not adequately address oil and gas mineral resource leasing. Federal regulations require that new Forest Plans include the preparation of a leasing analysis for National Forest lands not withdrawn for wilderness or other purposes. The required leasing analysis is currently being completed for the Los Padres National Forest (LPNF) in an Environmental Impact Statement (EIS) separate from this analysis. This document will address oil and gas potential and administrative availability of lands for leasing, under the 1920 Minerals Leasing Act, in the current LMP revision process for the Angeles, the Cleveland and the San Bernardino National Forests.

The Forest Service (FS) completed this report with the assistance of the United States Department of the Interior (USDI), Bureau of Land Management (BLM), who provided expertise in the development of the analysis parameters and the geologic data to support this reasonable foreseeable development scenario. During the development of the Oil and gas Leasing Environmental Impact Statement (EIS) for the Los Padres National Forest, the BLM worked closely with the FS to develop the reasonable foreseeable development scenario for the alternatives analyzed in the EIS.

II Regulatory Framework

The Federal Onshore Oil and Gas leasing Reform Act of 1987, and its implementing regulations (36 CFR 228.102), directed the Forest Service to identify lands with potential for oil and gas leasing, and to determine which of those lands are suitable for lease under what conditions. Specifically, 36 CFR 228.102(c) directs the Forest Service to identify lands in which there may be an interest in oil and gas development. In addition, for planning analysis purposes, the Forest Service is required to estimate the type and amount of future leasing and its general effects on other resources.

This Reasonably Foreseeable Development Scenario (RFDS) describes the general geological setting and the potential for oil and gas leasing and drilling activities in the next 15 years on public mineral estate lands within the three southern California National Forests (see the Los Padres National Forest exception). It also provides a range of expected impacts on the land as a result of exploration, drilling, and development operations. This information is required by regulation at 36 CFR 228.102, as part of the environmental analysis process for making a leasing decision, and by planning regulations (36 CFR 219.22).

The RFDS discusses the potential for oil and gas occurrence based on available geologic information. It also addresses the potential for oil and gas interest based on historical drilling trends, economic trends, and other socio-economic factors. The assessment of development potential includes a drilling activity forecast - which is an estimate of the type and amount of drilling and development activity which might take place. The RFDS also provides information for the analysis of effects of the Forest Plan and leasing decisions on other resources managed by the Forests. It is a general representation to the public and the decision maker of the potential effects of a leasing decision.

Note: This RFDS does not address surface disturbance related to pre-lease seismic exploration activities. Seismic notices of intent (NOIs) may be processed without having to have a lease.

A. Los Padres National Forest Exception

As of the date of this publication, the Los Padres National Forest (LPNF) is in the process of completing a forest-wide leasing analysis on the public lands within the forest boundary (the 36 CFR 228.102 (e) decision). A draft Environmental Impact Statement (DEIS) was made available for public review in late 2002. A final EIS is anticipated for release to the public in November 2003. Consequently, this RFDS, and the LMP revision, will not analyze oil and gas leasing for the LPNF but will incorporate by reference the environmental documents completed to support the leasing analysis for the LPNF. The Forest Supervisor's leasing decision will be included as an amendment to the LPNF revised LMP.

B. Why prepare this document

This analysis provides the basis for the assessment of the effects of potential mineral activities on other resources, under each of the proposed management alternatives in the EIS. The analysis must project the type/amount of post-leasing activity that is reasonably foreseeable as a consequence of conducting a leasing program consistent with that described in the proposal and for each alternative. In addition, the Forest Service must analyze the reasonable foreseeable impacts of post-leasing activity projected.

C. Decision to be made using this RFDS document

The purpose of this document is to support the determination of administrative availability of National Forest lands for leasing under the 1920 Minerals Leasing Act and amendments. According to 36 CFR 228.102 (d), upon making the S. California Forests-wide leasing decisions, the Regional Forester will notify the BLM as to the acreage and the locations of the lands deemed administratively available for leasing.

Although lands may be identified as available for leasing, a more site-specific analysis will be required before a parcel is offered for lease. It should be noted that no oil and gas-related surface disturbance is being authorized as a result of this RFDS. Any disturbance would be subject to the NEPA compliance.

III. Geologic Setting

The exploration for commercial accumulations of oil and gas revolves around attempting to locate a porous and/or fractured, permeable "reservoir." This reservoir is rock that may contain oil and gas that have migrated into the reservoir from "source rocks." Even if source rocks are present and oil and gas have migrated to the reservoir, more is required for the area to be prospective for oil and gas. It has to have been prevented from migrating further to shallower depths by the presence of impermeable formations and structures such as faults above the reservoir rocks, and the presence of a "trapping mechanism" along the oil and gas "migration path."

Traps block the movement of oil and gas migrating through porous and permeable rock. If all of the factors are present and the timing is correct, oil and/or gas may be present in sufficient quantities to support exploration and potential development.

A discussion of the geology of the Ventura Basin Province is shown as Attachment 1.

A. Angeles National Forest

Portions of the Forest near interstate 5 are within the Ventura Basin - a known geologic area with a long history of commercial oil and gas developments, mostly to the west in Ventura and Santa Barbara Counties. Oil-related historic activities within the Forest include leasing, drilling, road building.

B. Cleveland National Forest

No known hydrocarbon productive areas exist on public lands within the boundaries of the CNF. Although there may have been leasing, there has been no known history of applications for permits for oil and gas within the CNF.

C. San Bernardino National Forest

No known oil and gas activities have occurred on the SBNF.

IV. Mineral Potential

Analysis Parameters

The key elements that determine the amount of surface disturbance required for a specific lease areas are: availability of existing roads, slopes and terrain, environmentally-sensitive areas, surface/subsurface well location, complexity and size of the geologic structure, and accuracy and availability of surface and subsurface information.

It is estimated that an average of up to 7 acres of surface disturbance per drill hole is expected for access roads, well pad, and support facilities such as tank batteries and pipes (see Table 2).

New roads might have to be constructed, and existing roads upgraded, to support drilling equipment and vehicles. A typical 16-20 ft driving surface would be required in addition to disturbance for cut and fill slopes.

Drill pad and support facilities (such as central collection and tank batteries) could disturb and occupy about one acre per well. A typical pipeline would require a 10 ft wide corridor for each pipeline.

The exact number and location of specific wells that a lessee would likely to drill is, for the most part, subject to considerably uncertainty. All estimates given below were made as the result of evaluations of available geologic information and past drilling activity data. Additional support data is available at the Angeles National Forest Supervisor's Office.

High Potential

1) Inclusion in a USGS play, or 2) demonstrated existence of (a) source rock, (b) thermal maturation, and (c) reservoir strata exhibiting permeability and/or porosity, and traps.

Low or No Potential

Specific indications that one or two of (a), (b), or (c) may not be present, or demonstrated absence of (a), (b), and (c) that precludes the occurrence of oil and gas.

The following table displays the number of acres of potential oil and gas occurrence on the S. California Forests:

Table 1 – Classification of Oil and Gas Potential

Forest	Acres Total	Acres Withdrawn	Potential for Oil & Gas Occurrence Acres (high)	Potential for Oil & Gas Occurrence Acres (low or none)
Angeles	662,983	394,547 (60%)	51,200	217,236
Cleveland	420,878	87,865 (20%)	0	333,013

San Bernardino	665,752	147,430 (22%)	0	518,322

A. Angeles National Forest

A total of 51,200 acres have been identified as high potential for oil and gas occurrence. Within this area, it is reasonable to assume that a range between 5-25 wells could be drilled in the next 15 years, with associated disturbance of 35-175 acres, split about 60/40 between long term disturbance (2+ years) and short term (< 2 years). There would also be an estimated 100 acres of transitory (very short term) disturbance related to seismic exploration. All seismic operations would be required to adhere to standards to minimize impacts where feasible. This would include requirements to follow existing roads, hand carry lines, etc. where practical.

It can reasonably be expected that most (or all) wells would be drilled in the areas identified as high potential. However, all areas not identified as withdrawn or otherwise unavailable are potentially available for leasing.

For purposes of this RFDS, the Ventura Basin was all considered to be "high potential." A portion of the Basin (onshore portion) is within the Angeles NF, so the reserves in this RFDS are those that would be attributed to that portion of the Basin within the NF. Approximately 2% of the Basin is within the Angeles NF boundary, so approximately 2% of the total undiscovered reserves in the Basin are projected to be from USFS land.

B. Cleveland National Forest

No areas have been identified for oil and gas potential by the BLM or the USGS. However, 1-2 speculative wells could be drilled in areas not considered by conventional wisdom to be "prospective." It is unlikely that such wells would be productive, and the estimated 7-14 acres of associated disturbance would likely be short term.

C. San Bernardino National Forest

No areas have been identified for oil and gas potential by the BLM or the USGS. However, 1-2 speculative wells could be drilled in areas not considered by conventional wisdom to be "prospective." It is unlikely that such wells would be productive, and the estimated 7-14 acres of associated disturbance would likely be short term.

Table 2 - Oil and Gas Potential Acreage & Anticipated Range of Wells & Disturbance

Forest	Acreage High Potential	# of Wells Anticipated*	Potential Acreage of Surface Disturbance**
Angeles	51,200	5-25	35-175
Cleveland	0	0-2	0-14
San Bernardino	0	0-2	0-14

**Estimation based on BLM's estimate of # of acres of high potential divided by the total number of acres in the Ventura Basin times the total number of wells expected to be drilled in the entire basin.*

***Includes an estimate of 6 acres per well for new road construction and access in areas where little or no existing roads and trails exist. Includes an estimate of one acre disturbance for drill pad, tank batteries, pipelines and other support facilities.*

V. Estimated Effects of Leasing

Effects of mineral and energy activities on other resources stem from issues relating to access, exploration and development of the subsurface mineral resource. Surface disturbing activities associated with accessing (road building), exploring (drilling) and development (drilling and facilities) of the mineral resource result in impacts to the land and the resources.

Lands that contain mineral and energy resources also contain physical, biological, recreational and cultural resources. At times, objectives for mineral resource management conflict with objectives for other resource management.

Even though each oil and gas well, by itself, may not cause substantial impacts to the land and the resources, the

increased number of wells in any given area adds additional cumulative impacts to the land and on the environment.

Table 3 – Angeles National Forest Oil and Gas Potential Leasing Acreage Anticipated Long-term and Short-term Specific Disturbance

Disturbance Type	Long Term (> 2yrs)	Short Term (0-2yrs)
Producing Wells*: Well Pad and Facilities Site (1 acre footprint per site) (#/acres)	7/7	0
Dry Holes** (1 acre footprint per site) (#/acres)	0/0	5/5
Access Roads*** (miles/acres)	7/42	5/30
Seismic Activities**** (miles/acre)	0	100/100
Reserves***** (MBO/MMCF) 2656/3200	n/a	n/a
Total	49	135

Based on 51,200 acres of high potential area located on public lands within the Angeles National Forest.

**Producing wells = .0014 wells/acre & .00100 acre disturbance/acre*

***Dry holes=.00010well/acre & .00070 acre disturbance/acre*

****A typical 16-20 ft driving surface would be required in addition to disturbance for cut and fill slopes.*

*****Seismic= 8' wide path = 1 acre/mile.*

******Each producing well makes 332 thousand barrels of oil (MBO) & 400 million cubic feet (MMCF) of gas.*

Table 4 – Cleveland National Forest Anticipated Long-term and Short-term Specific Disturbance

Disturbance Type	Long Term (> 2yrs)	Short Term (0-2yrs)
Producing Wells*: Well Pad and Facilities (#/acres)	0/0	0/0
Dry Holes** (#/acres)	0/0	2/2
Access Roads*** (miles/acres)	0/0	2/12
Seismic Activities**** (miles/acres)	0/0	0/0
Reserves***** (MBO/MMCF) 0/0	n/a	n/a
Total	0	14

Table 5 – San Bernardino National Forest Anticipated Long-term and Short-term Specific Disturbance

Disturbance Type	Long Term (> 2yrs)	Short Term (0-2yrs)
Producing Wells*: Well Pad and Facilities (#/acres)	0/0	0/0
Dry Holes** (#/acres)	0/0	2/2
Access Roads*** (miles/acres)	0/0	2/12
Seismic Activities**** (miles/acres)	0/0	0/0
Reserves***** (MBO/MMCF) 0/0	n/a	n/a
Total	0	14

The Forest Service and the BLM work together to review any proposed lease/drilling application and conduct the necessary environmental reviews. Any identified impacts to the land and resources require the development of mitigation measures to reduce or eliminate such impacts. These mitigation measures - often incorporated as lease stipulations at the time the tract is offered for leasing - become an integral part of the permit conditions of approval. The public will have an opportunity to provide comment on proposals that are subject to the National Environmental Policy Act's (NEPA's) disclosure and compliance process.

VI. Conclusions

The Reasonable Foreseeable Development Scenario (RFDS) is the same across all of the alternatives because all alternatives have the same exact area classified as high potential (51,200 acres of high potential area with the Angeles National Forest). A total surface disturbance of 84 acres (49 long term, 35 short term) could be expected from 12 wells (5 dry holes, 7 producers). This number could reasonably range between 35-175 acres and 5-25 wells. An additional short-term disturbance of 100 acres could be expected from seismic operations. Total reserves are estimated to be 2.7 MMBO and 3.2 BCF.

According to BLM, the Cleveland and the San Bernardino National Forests do not contain areas with high potential for oil and gas development, although 1 or 2 wells may be drilled in each of these forests. These wells could not reasonably be expected to find any reserves.

The Los Padres is not included in this analysis.

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Bain, Desmond, The Reasonable future Development Scenario for the Los Padres National Forest, USDA-Forest Service, August 1993.

The oil and gas potential maps used for this RFDS were prepared in consultation with the BLM as well as data from the USGS National Assessment of U.S. Oil and Gas Resources (1995) and the Los Padres Draft EIS (2002).

Attachment 1—VENTURA BASIN PROVINCE (013)

By Margaret A. Keller

Introduction

The Ventura Basin Province of Southern California consists of the portion of the Western Transverse Ranges that is bounded approximately on the north by the Santa Ynez and Big Pine Faults, on the northeast and east by the San Andreas Fault, on the west by the 3-mi limit of State waters, and on the south by the Santa Monica-Malibu Coast fault system and the 3-mi limit of State waters of the Santa Barbara-Ventura coastal area. The province is as much as 54 mi wide and 183-mi long. It covers approximately 4,327 sq mi on land, including the Northern Channel Islands, and contains an additional 1,018 sq mi of State waters, including the area around the islands.

The province contains a Cretaceous to Pleistocene, mostly marine, sedimentary section in a major fold and thrust belt that began developing during the late Pliocene. The Ventura Basin is the onshore part of the main structural downwarp that formed during this deformation; its foundered offshore extension is the modern Santa Barbara Basin. All of the sedimentary section is productive somewhere in the province, and most reservoirs are sandstones with favorable porosity and permeability. The major ones, of Pliocene and Miocene age, comprise 75-80 percent of the on-land plus State waters production in the province. In general, most traps are anticlinal, modified to some degree by faults and with significant stratigraphic influence.

Six plays are described for the province: the Paleogene–Onshore Play, (1301); the Paleogene–Offshore State Waters Play (1311); the Neogene–Onshore Play (1302); the Neogene–Offshore State Waters Play (1312); the Pliocene Stratigraphic Play (1303); and the Cretaceous Play (1304). Undiscovered petroleum resources are assessed for the Paleogene and Neogene Plays (resource for the Pliocene Play is added to the Neogene Play), but the Cretaceous Play, which was determined to have a low probability of occurrence of an accumulation > 1 MMBO or 6 BCFG was not quantitatively assessed. The State waters and onshore areas of these plays are the subject of this report.

The first field discovered in the Ventura Basin was Santa Paula in 1861. Since then, approximately 96 oil and gas fields (depending on how accumulations are grouped) have been discovered, 66 of which have ultimate recovery greater than 1 MMBO or 6 BCFG. Nine gas fields are present along the Santa Barbara coast, but most of the province contains oil accumulations localized along several major anticlinal trends. The most productive is the Rincon trend with several very large Pliocene accumulations. The largest is made up of three giant (> 100 MMBO) fields, Ventura Avenue, Rincon, and San Miguelito, whose combined ultimate recovery is estimated at 1,530 MMBO, 2.65 TCFG, and 153 MMBNGL. Several other important anticlinal trends also contain giant fields. The most recent new field discovery in the onshore area of the province is Rincon Creek found in 1982. New drilling has mainly focused on locating new pools and extending existing fields, with very minor exploration outside of existing fields. In the offshore, where most exploration has focused since the late 1950's and early 1960's–although limited by State and Federal leasing regulations–the most recent new field discovery in State waters is Santa Clara, found in 1971. Cumulative production in the province through 1990 is approximately 2,640 MMBO, 4.64 TCFG, and 160 MMBNGL.

Acknowledgments

Helpful reviews of preliminary play concepts were provided by Tom Hopps, Thane McCulloh, William Bazeley, Duane Cavit, James Galloway, and Gary Huftile. Scientists affiliated with the American Association of Petroleum Geologists and from various State geological surveys contributed significantly to play concepts and definitions. Their contributions are gratefully acknowledged.

Conventional Plays

1301. PALEOGENE–ONSHORE PLAY

1311. PALEOGENE–OFFSHORE STATE WATERS PLAY

Description: The Paleogene Play consists primarily of oil and associated gas accumulations, with condensate, in structural and combination traps. Stratigraphic traps are rare. Non-associated gas is also produced from nine fields in State waters and along the Santa Barbara coast. Reservoirs are sandstones of Paleocene to early Miocene age. Excluding non-prospective and basement areas of the eastern part of the province, the play area includes almost the total remaining province, with the assumption that a Paleogene and (or) lower Miocene section has some potential if present at depths greater than about 20,000-25,000 ft in the Santa Clara Trough.

Reservoirs: Important reservoirs are sandstones of the nonmarine, Eocene to early Miocene Sespe Formation in the areas both north and south of the Santa Clara Trough. The Sespe commonly has good to excellent reservoir properties and is up to 7,000 ft thick in the subsurface. Another important reservoir, commonly coproduced with the Sespe, is the overlying shallow-marine Vaqueros Formation. The Vaqueros is up to 300 ft thick, has excellent reservoir properties in places, and is overlain by the Rincon Shale–an excellent regional seal. Limited porosity and permeability data from Vaqueros and Sespe reservoirs show a range of 10-30 percent porosity and 18-900 mD permeability. Average reservoir thickness ranges from 50-3,000 ft, and the average depth to the top of reservoirs is 100-11,500 ft. Other reservoirs of minor importance are the Matilija Formation, Coldwater Sandstone, and Llajas Formation of Eocene age. Paleocene clastic rocks south of the Santa Clara Trough are also minor reservoirs.

Source rocks: Source rocks are probably mainly the organic-rich mudrocks of the Rincon Shale and Monterey, Modelo, Sisquoc, and Santa Margarita Formations. However, carbon isotopic data suggest that another hydrocarbon source, probably Eocene marine shale, is present in the western coastal area of the play. Marine shale of the Paleocene-Eocene Santa Susana Formation and the Eocene Llajas Formation also appear to be suitable sources south of the Oak Ridge Fault where oil is produced from Sespe sandstones and interbedded sandstones in the Llajas. Most hydrocarbons in the play were probably generated from Miocene source rocks in the Santa Clara Trough and other deep areas. Migration from Miocene and possibly older source rocks probably took place after the onset of late Pliocene compressional tectonics, which formed most of the structural traps. Burial reconstructions north of the Santa Clara Trough suggest that Eocene and older source rocks could have generated hydrocarbons before and during the early Miocene, before the 90¡ Miocene rotation of the province to its present orientation. South of the trough along the Oak Ridge Trend, recent reconstructions by Hathon (1992) show that the Paleocene and Eocene Santa Susana "Shale" entered the early phase of generation on the crest of South Mountain during the late Pliocene and the main phase of generation on the flanks of South Mountain during the Pleistocene.

Traps: Traps are mainly anticlines and faulted anticlines. South of the Oak Ridge Fault along the Oak Ridge Trend, the major producing trend in the play, anticlinal accumulations in Eocene and Oligocene sandstones are found in numerous oil fields. Other important anticlinal trends parallel the Santa Barbara coast. Additional traps include a homocline with tar seal and other permeability barriers, significant unconformities, and closure created by faults and dip reversals. Marine shale units within the Paleogene and Neogene sequences all provide seals. The areas of maximum production range from 50 acres at the Oat Mountain field to 2,970 acres for the Sespe field. Many fields produce from multiple stacked reservoirs in more than one formation accounting for large volumes of petroleum production from relatively small land areas.

Exploration status: Since the discovery of the Sespe field in 1887, some areas of the play have been extensively explored, but not the rugged mountainous areas of the north or areas where a thick overlying Neogene sequence is productive. Of the 32 significant oil and gas fields in the play (> 1 MMBO or 6 BCFG), 10 also produce from the Neogene section and 6 are gas fields. The largest oil accumulation in the South Mountain area has produced 124 MMBO from reservoirs in this play; the largest gas field, Molino Offshore, has produced 258 BCFG. The average size of the gas fields is 94 BCFG. Cumulative production in the play through 1990 is 525 MMBO, 1.23 TCFG, and 33.3 MMBNGL. In the onshore the average field size is approximately 28 MMBOE. In the offshore it is 17 MMBOE.

Resource potential: The play has a good to medium potential for undiscovered oil and gas. Although not well documented province wide, in many places the presence of laumontite as a pore-filling, especially in the pre-Miocene section, is an important limiting factor for reservoir quality. Potential of the play is thought to be good in the relatively unexplored offshore extensions of major structural trends. In the Santa Clara Trough, possible reservoir rocks may be too deep to retain favorable porosity and permeability; however, this potential remains untested. Undiscovered recoverable resources probably remain in the onshore on the north and south margins of the Santa Clara Trough. Relatively unknown potential remains in poorly known deeper structures that formed prior to Miocene rotation of the province.

1302. NEOGENE–Onshore Play

1312. NEOGENE–Offshore State Waters Play

The Neogene Play is characterized by oil and associated gas accumulations in structural and combination traps in clastic reservoirs of early Miocene to Pleistocene age. Discovered accumulations in purely stratigraphic traps are rare. The play covers Å 130 mi of the east-west length of the province. The north and south boundaries of the play, in some places a fault, are defined by the extent of the Neogene sequence in the subsurface. The northern boundary is approximately equivalent to the southern edge of the Santa Ynez and Topa Topa Uplifts. The southern boundary, along the north side of the Santa Monica Mountains, is equivalent to the southern boundary of Neogene Basin remnants.

Reservoirs: Major reservoirs are unlithified turbidite sands of the Pliocene and Pleistocene Pico Formation. Other important reservoirs are in the Miocene and lower Pliocene section, predominantly marine sandstone but also fractured, fine-grained rocks of the Rincon, Monterey, Modelo, Sisquoc, and Santa Margarita Formations. Fractured, fine-grained siliceous rocks of the Monterey Formation are important reservoirs in only a few fields in the onshore and State waters. Average reservoir thicknesses range from less than 100 ft to as much as 5,000 ft.

Average depth to the top of reservoirs is also variable, ranging from about 150 ft to 14,250 ft. Data on discovered reservoirs indicate a range of 14-35 percent porosity and 13-5,500 mD permeability for the Pico and younger reservoirs, and 11-27 percent porosity and 7-480 mD permeability for the Monterey and Modelo Formations.

Source rocks: Potential source rocks are organic-rich mudrocks of Miocene and early Pliocene age, including the Rincon, Monterey, Modelo, Sisquoc, Santa Margarita, and possibly part of the lower Pico Formations, although the Monterey Formation is thought to be the main source. The Monterey contains excellent oil-prone source rocks with total organic carbon contents Å 3-5 percent on average, but as high as 23 percent in some beds. Organic matter is marine and mixed marine-continental in origin. Most of the oil was probably generated in the Santa Clara Trough and other deep areas of the play where the Pliocene and Pleistocene sequence reaches a thickness of approximately 20,000 ft. Migration probably took place, for the most part, after the onset of late Pliocene compressional tectonics, which formed most of the structural traps in the play.

Traps: Traps are mainly anticlinal with associated faulting, but stratigraphy is an important control in the traps of numerous fields. The area of maximum production ranges from 50 acres at Weldon Canyon to 3,410 acres at the Ventura Ave. field, with multiple stacked reservoirs in many fields. Purely stratigraphic traps are rare. One of the potentially important targets for stratigraphic trapping, Pliocene turbidite sand units in the flat to gently dipping central Santa Clara Trough, is described as a separate play but is assessed with the total Neogene Play because of the small amount of resource discovered to date. Adequate seals are provided by impermeable shales and fine-grained rocks in the Neogene sequence. The deepest well in the basin, drilled in the onshore Rincon Trend, reached a total depth of 21,500 ft, bottoming within the upper Miocene section. Thickness of the lower Miocene to Pleistocene sedimentary sequence varies, with the maximum estimated to be greater than 26,000 ft.

Exploration status: The play has been extensively explored since 1861 when the Santa Paula field was discovered. In the onshore part of the play, 33 oil fields produce solely from the Neogene. Eight have both Paleogene and Neogene production. Oil fields average approximately 66 MMBOE. The largest accumulation, at 1,871 MMBOE, is the combined Ventura Ave., San Miguelito, and Rincon fields. Cumulative production through 1990 is 1,890 MMBO, 3.23 TCFG, and 157 MMBNGL. In the State offshore, the three oil fields producing in this play average 73 MMBOE; cumulative production through 1990 is 188 MMBO, 183 BCFG, and 1.14 MMBNGL.

Resource potential: The future resource potential of the play is estimated to be very good, especially in the relatively unexplored offshore extensions of major structural trends in the play and also beneath the hanging wall of the San Cayetano Thrust Fault. Undiscovered accumulations might also be found along the well-explored major structural trends in the onshore, particularly adjacent to the Santa Clara Trough and in the eastern Ventura Basin. Relatively little known potential exists for targets deeper than Å15,000 ft as well as for prospects dominated by diagenetic and stratigraphic trapping mechanisms. However, within the Santa Clara Trough, stratigraphic potential may be good in sand units within the upper and lower Pliocene section, as found at Fillmore and also Saticoy as well as other areas in the footwall of the Oak Ridge Fault.

1303. Pliocene Stratigraphic Play

The Pliocene Stratigraphic Play, which is both on land and in State waters, is characterized by stratigraphically trapped oil and associated gas accumulations in turbidite sand units of the Pliocene and Pleistocene Pico Formation. Discovered accumulations in pure stratigraphic traps are rare in this province. The play covers an elongate area Å 35 mi east to west and Å 10 mi north to south. The play is bounded on the north by the San Cayetano Fault and on the south by the Oak Ridge Fault and occupies the relatively flat to gently dipping portion of the central Santa Clara Trough or syncline between these faults.

Reservoirs: Major discovered reservoirs are unlithified turbidite sands of the middle part of the Pico Formation of Pliocene and Pleistocene age found in two zones of the Fillmore field. Other possible reservoirs might be in the lower Pliocene section, predominantly marine sandstone. Average reservoir thicknesses range from 35 to 50 ft, with net sand thicknesses up to 80 ft. Average depth to the top of reservoirs ranges from about 13,750 to 13,900 ft. Data on reservoirs of the Fillmore field indicate a range of 20-22 percent porosity and 50-150 mD permeability for the Pico. Other Pico and younger reservoirs in structural traps have a range from 14 to 35 percent porosity and 13 to 5,500 mD permeability. The sediments deposited in this area created one of the thickest known sections of Pliocene and Pleistocene sediment, 15,000-20,000 ft.

Source rocks: Potential source rocks are organic-rich mudrocks of Miocene and early Pliocene age, including the Monterey, Modelo, Sisquoc, Santa Margarita, and possibly part of the lower Pico Formations, although the

Monterey Formation may be the main source. The Monterey contains excellent oil-prone source rocks with total organic carbon contents Å 3-5 percent on average, but as high as 23 percent in some beds. Organic matter is marine and mixed marine-continental in origin. The oil was generated in the Santa Clara Trough where the Pliocene and Pleistocene sequence reaches a thickness of as much as approximately 20,000 ft. Migration in the trough probably took place close to the time of, and also after, the onset of late Pliocene compressional tectonics, which formed most of the structural traps in the province, including possibly the faulting of already formed stratigraphic traps that are now in the Pliocene succession of the footwall of the Oak Ridge Fault.

Traps: Trapping is dominantly stratigraphic by pinch-out of sand bodies. The most important potential targets are Pliocene turbidite sand units in the flat to gently dipping central Santa Clara Trough. At Fillmore, the area of maximum production is Å500 acres; both larger and smaller trap sizes are possible. Adequate seals are provided by impermeable shales and fine-grained rocks in the Neogene sequence. The deepest well in the basin reached a total depth of 21,500 ft, bottoming within the upper Miocene section.

Exploration status and resource potential: The play has been explored a good deal since the discovery of the Fillmore field in 1954. Except for several accumulations (the Saticoy field, the Bridge pool at South Mountain, and pools at Bardsdale and Shiells Canyon) in the footwall of the Oak Ridge Fault which may have been stratigraphically controlled before the onset of late Pliocene deformation, no other fields like Fillmore have been found. Therefore, this play is described separately, but assessed with the total Neogene Play because of the small amount of resource that has been discovered after a good deal of exploration on land. There has not been any offshore exploration for the play by drilling in State waters. Cumulative production at Fillmore through 1990 is 13.2 MMBO, 19.5 BCFG, and 600 MBNGL; ultimate recovery is projected to 28.2 MMBOE. The future resource potential of the play may be good, especially in the unexplored areas of the Santa Clara Trough and possibly in its offshore extension. There may also be potential in the footwall of the San Cayetano Thrust Fault. Relatively little is known of the potential for targets deeper than Å15,000 ft.1304.

Cretaceous Play (Hypothetical)

The Cretaceous Play consists of oil and associated gas accumulations, but also hypothetical dry gas accumulations, in structural, stratigraphic, and combination traps. The two fields in the play, now abandoned, have together produced less than a million barrels of oil; however, gas production is known from a test within the play area. Reservoirs are sandstones of Late Cretaceous age located south of the Santa Clara Trough in areas where the top of the Upper Cretaceous is thought to be present at depths of 15,000 ft or less, and also where the thick Miocene volcanic succession is absent. The Cretaceous section north of the Santa Clara Trough has tested minor oil and gas in a few places; however, it is believed to have very low porosity and permeability (and therefore potential) due, in part, to laumontite formation. Therefore, this area is not included in the play.

Reservoirs: Reservoirs are marine sandstones of Late Cretaceous age. Oil production in the two discovered fields is from depths to the top of reservoirs of 4,150 and 7,200 ft, in intervals 500 and 200 ft thick respectively. The Upper Cretaceous section consists of sandstone, conglomerate, and shale. It ranges in thickness to greater than 6,500 ft in the areas of the Simi Uplift and the Santa Monica Mountains and is likely to be greater than 5,000 ft thick in much of the Ventura Basin (Nagle and Parker, 1971). Few data are available, but reservoir quality of the Cretaceous section in the play area is expected to be quite variable and generally poor in most areas. However, in the vicinity of the discovered fields near the Simi Uplift, Nagle and Parker (1971) describe the Cretaceous rocks as having "attractive reservoir potential," comparable to those of younger rocks which yielded commercial production elsewhere."

Source rocks: Possible source rocks include marine shales in the Cretaceous section, which are hypothesized to be gas prone due to a greater proportion of continentally derived plant material in the organic matter. Little is known of their potential for generating oil or gas south of the Santa Clara Trough; however, a number of analyses north of the Santa Clara Trough (Frizzell and Claypool, 1983) characterize this organic matter as having poor capacity for petroleum generation. Other potential sources are marine shales within the Paleocene, Eocene, and Miocene sections, which may have sourced the Cretaceous rocks during favorable structural juxtaposition. Recent reconstructions by Hathon (1992) show that the Eocene and Paleocene Santa Susana "Shale" south of the Santa Clara Trough at South Mountain became mature beginning during the late Pliocene, coincident with the formation of structural traps during the most recent tectonism. The Miocene Monterey Formation is believed by many to be the main source of the oil in most fields south of the Santa Clara Trough, oil generation having begun in the trough during the Pliocene and then migration proceeding since that time.

Traps: Traps may be structural or stratigraphic or a combination of both. Structural traps may have formed during tectonism since the late Pliocene or in earlier periods of deformation, which are not as well understood. More study of Cretaceous depositional systems is necessary to understand the potential for stratigraphic trapping in the play. The size of discovered traps, 20 and 30 acres, is small, but larger traps may be present. Marine shale units within and overlying the Cretaceous, as well as other permeability barriers such as unconformities, could provide seals.

Exploration status: Two oil fields have been discovered in the play in the area of the Simi Uplift. The Horse Meadows field was discovered in 1952 and abandoned in 1966 after producing 136,556 bbl of oil and 86,746 MCFG. The Mission field produced 536,621 bbl of oil and 301,411 MCFG from Cretaceous sandstone as well as a pool in Pliocene sand between its discovery in 1953 and abandonment in 1977. Oil and gas in shows and production tests are reported for several wells throughout the province.

Resource potential: This play has not been well explored because of the many favorable prospects in the overlying Tertiary section. Also, pre-Pliocene structures, and therefore trapping, are not well understood in most of the province because of the strong overprint by younger tectonism. However, undiscovered resources probably remain south of the Santa Clara trough. Most certainly laumontite formation and other factors will preclude favorable porosity and permeability in some areas; however, porosity and permeability are favorable in the area of existing fields, and the possibility of finding other favorable areas cannot be ruled out until more exploration is done in this play.

Unconventional Plays

There are no unconventional plays described in this province report. However, unconventional plays listed in the surrounding provinces may include parts of this province. Individual unconventional plays are usually discussed under the province in which the play is principally located.

References

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Nagle, H. E., and Parker, E. S., 1971, Future oil and gas potential of onshore Ventura Basin, *in* Cram, I. H., ed., Future petroleum provinces of the United States--Their geology and potential: American Association of Petroleum Geologists, Memoir 15, vol. 1, p. 254-297.

Appendix J. Glossary

Abiotic: Not involving or produced by organisms.

Acre-foot (Ac-ft): The amount of water covering an area of one acre to a depth of one foot.

Adaptive management: A process for implementing management decisions that requires monitoring of management actions and adjustment of decisions based on past and present knowledge. Adaptive management applies scientific principles and methods to improve management decisions incrementally as experience is gained in response to new scientific findings and societal changes.

Adverse Effects (Heritage Resources): Any effect on a heritage resource that would be considered harmful to those characteristics that qualify the property for inclusion in the National Register of Historic Places.

Aerosol: Can be either wet or dry small particles in the atmosphere, also known as "particulate matter."

Aesthetics: The study of science, or philosophy dealing with beauty in nature with judgments concerning beauty. In scenery management, it describes landscapes that give visual and sensory pleasure.

Aggradation: A raise of elevation in a streambed, caused by sediment supply in excess of sediment-transport capacity.

Aggregate: Crushed rock material, used for road surfacing.

Air Pollution Control District (APCD): Which is a regional government bureau responsible for attainment and management of air quality standards through permitting and regulating emission source.

Air Quality Attainment Plan (**AQAP):** Equivalent to Air Quality Management Plan, which outlines rules and regulations for improving the quality of air on the region to reach an attainment status (in attainment of standards).

Air Quality Management Plan (**AQMP):** Outlines rules and regulations for improving the quality of air on the region-to reach standards.

Air Quality Standard: The specified average concentration of an air pollutant in ambient air during a specified period at or above which level the public health may be at risk, equivalent to Ambient Air Quality Standard.

Airtanker: A fixed wing aircraft that delivers fire retardant along the fire edge.

Algae: A collective term for several taxonomic groups of primitive chlorophyll-bearing plants, which are widely distributed in fresh, salt water and moist lands. This term includes the seaweeds, kelps, diatoms, pond scum and stoneworts.

Alternative, Preferred Alternative, Selected Alternative: One option for meeting the purpose and need for a proposed action (e.g. Forest Plan revision). Alternatives are described and analyzed in the Environmental Impact Statement (EIS). The **Preferred Alternative** is the alternative recommended for implementation at the draft Forest Plan phase based on the evaluation completed in the planning process; it is not a decision. The **Selected Alternative** is the alternative chosen by the Regional Forester for implementation in the Forest Plan based on the evaluation completed in the planning process. This decision is documented in the **Record of Decision** (ROD).

Ambient Air: Any unconfined portion of the atmosphere; the outside air.

Ambient Air Quality Standard (**AAQS):** Federal and state measure of the level of air contamination that is not to be exceeded in order to protect human health.

Ambient Noise Level (ANL): Noise from all sources near and far. ANL constitutes the normal or existing level of environmental noise at a given location.

Animal Unit Month (**AUM):** Equals the tenure of one animal unit (considered to be a cow and calf, based on the average daily forage consumption of 26 pounds of dry matter per day) on range for a period of one month.

Aquifer: Water-bearing rock formation or other subsurface layer. A body of rock that contains sufficient

saturated permeable material to conduct groundwater and to yield significant quantities of water to wells and springs.

Arroyo: A stream channel or gullies in arid country, usually with steep banks, dry much of the time.

Attribute: An inherent landscape characteristic, trait or quality.

Average: As a measure, the sum of the measurements (over a specified period) divided by the number of measurements.

Backfire: A fire set along the inner edge of a fireline to consume the fuel in the path of a wildfire and/or change the direction of force of the fire's convection column.

Background: The distant part of the landscape area located from 4 miles to infinity from the viewer.

Badlands topography: Arid landscapes characterized by intricate, sharp erosion sculptures of highly erosive soft sedimentary rocks with a very fine drainage network and little to no vegetative cover.

Barranca: A ravine caused by rain, or a watercourse.

Basal area: The cross sectional area of a tree measured at breast height (4.5 feet or 1.37 meters above the ground) by use of a wedge prism or calculated from the diameter expressed in either square feet per acre or square meters per hectare. A way of measuring how much a site is occupied by trees.

Basal area increment (BAI): Increase in tree basal area during a specified period usually over 1 year or 10 years. BAI may be calculated on per tree, per acre, or hectare basis.

Baseline: A set of existing conditions against which change is to be described and measured.

Bedrock: The solid rock that underlies loose material, such as soil, sand, clay, or gravel.

Berm: Native or aggregate material built up adjacent to a traveled roadway. Reasons for installation vary and can include surface water control, hazard mitigation (in lieu of guardrail) or temporary stockpiling of slide debris.

Best Available Control Technology (BACT): An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to refulation under the Clean Air Act which would be emitted from any proposed major, new, or modified stationary source.

Best Environmental Design Practices: Environmentally sustainable landscape design solutions that improve ecosystem health and the quality of the outdoor recreation experience. These solutions provide project-level guidance for the implementation of the Chavez-Wambaugh Protocol.

Best Management Practices (BMPs): Resource management practices that are designed to prevent or reduce undesirable side effects of implementation of management actions.

Biogeochemical cycles: The dynamics of nutrient and carbon flows and pools between biotic and abiotic elements in an ecosystem. Pools and flows between them may include biotic, geological, atmospheric, oceanic and/or cryotic components.

Biological diversity (Biodiversity): The variety of life, including the variety in genes, species, and ecosystems and the ecological processes that connect everything within a common environment.

Biomass: The amount and type of organic matter that is contained within a given area, the total weight of all living organisms in a biological community.

Biota: Living organisms, all the plant and animal life of a particular region.

Bitumens: Any of various mixtures of hydrocarbons (as tar) often together with their nonmetallic derivatives that occur naturally or are obtained as residues after heat-refining natural substances (as petroleum); specifically: such a mixture soluble in carbon disulfide.

Blading: A type of road surfacing activity to improve drivability.

Brackish: Pertaining to water, generally estuarine in which salinity ranges from 0.5 to 17 parts per thousand by weight.

Bridge: A road or trail structure including supports erected over a depression or an obstruction such as water, a road, a trail, or railway and having a deck for carrying traffic or other loads.

Brushing: The act of removing brush along side of roadway to improve visibility.

Burning index: A number related to the contribution that fire behavior makes to the amount of effort needed to contain a fire in a particular fuel type within a rating area. Pertaining to an index for describing fire danger.

Cambial tissues: Active growth tissues of vascular plants.

Candidate Species: Plant and animal taxa considered for possible addition to the list of Federal Endangered and Threatened Species.

Canopy: The part of any stand of trees represented by the tree crowns.

Capital Investment Program (CIP): Forest Service infrastructure construction and reconstruction funding program.

Carbon Monoxide (CO): A colorless, odorless, toxic gas produced by incomplete combustion of carbon in fossil fuels.

Catastrophic wildfire: An especially intense and widespread fire that usually but not always occurs in forests that is outside the historical range of variability in terms of forest structure and forest fuels due to fire suppression.

Cenozoic: The youngest geologic era, ranging from present to 66 million years ago.

Channel Lining: Artificial hardening of the sides and/or bed of a stream channel to prevent erosion. Concrete, soil cement and rock riprap are typical channel linings.

Chaparral: Dense thicket of shrubs and small trees characteristic of southwestern U.S.

Characteristic: Qualities that constitute a character or that characterizes a landscape, a distinguishing trait, feature, quality, uniqueness or attribute.

Chip seal: Thin layer of hard surface material that includes an emulsified material that adheres the material's particles to each other and the road surface it is place on.

Coarse filter management: Land management that addresses the needs of all associated species, communities, environments and ecological processes in a land area (see fine filter management).

Coarse woody debris: Woody biomass that consists of snags (standing dead trees), logs and larger diameter branches (2.5 cm) on the forest floor.

Code of Federal Regulations (CFR): The codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government. The Code is divided into 50 titles that represent broad areas subject to regulation.

Community buffer: Lands directly adjacent to communities where vegetation arrangement has been modified to reduce the impacts of wildfire.

Community Noise Equivalent Level (CNEL): Averaging of noise levels on a measurement scale of decibels that increases the actual noise measurement, to account for an increased sensitivity to noise during late evening, nighttime and morning hours (the increments are 5 dB from 7 to 10 pm and 10 dB from 10 pm to 7 am).

Concern Level: The classification of travel routes or use areas based on the public's concern over the alterations in the landscape from those viewpoints. There are three Concern Levels representing degrees of scenery importance: (1) High, (2) Moderate and (3) Low.

Concessionaire: A special-use permit holder who provides goods and services primarily at Forest Service developed recreation sites (excluding ski areas).

Conservation Education: Communication strategies used to develop public awareness, appreciation and support for conservation issues and policies. Includes interpretation, environmental education and visitor information.

Corridor: Elements of the landscape that connect similar areas, such as riparian areas.

Coastal Block: Geologic term describing area adjacent to the coast, which may be faulted or fractured.

Coastal Zone: That land and water area of the state of California extending seaward including all offshore islands and extending inland 1,000 yards from the mean high tide line of the ocean.

Crossdrains: Drainage structure (culvert) located outside of a stream channel.

Crown fire: A fire that burns in the forest canopy. "Passive" crown fires are those that are supported by surface fires with occasional burning of overstory trees, while "active" crown fires are those that burn through overstory trees with no associated surface fire.

Cryotic: A substance that has been frozen creating cryptogamic crust layers.

Cryptogamic: Plant (as a fern, moss, alga, or fungus) reproducing by spores and not producing flowers or seed.

Cultural landscape: A geographic area (including both cultural and natural resources and the wildlife or domestic animals therein) associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. There are four general types of cultural landscapes (and they are not mutually exclusive): historic sites, historic designed landscapes, historic vernacular landscapes and ethnographic landscapes.

Cultural use: Access to areas with significant pre-historical, historical, or contemporary Native American use.

Cutbank: A bank on uphill side of road that is a result of cutting into the hillside to create a road surface.

Cyclonic: A large air mass circulating counterclockwise, in northern hemisphere.

Decibel (dB): Logarithmic unit which describes the wide range of sound intensities to which the human ear is sensitive.

Decibel-A-Weighted (dBA): Decibel unit scale that is modified to better represent the relative insensitivity of the human ear to low-pitched sounds.

Decommissioning: Permanently closing a road to vehicular use and left in a hydrological maintenance free condition. Decommissioning will include activities such as water barring, out sloping, re-contouring, decompaction of road surface, removal of drainage structures, and road barricades as needed.

Degradation: Lowering of streambed elevation, caused by sediment-transport capacity in excess of the sediment supply. Degradation can be long-term (after the passage of many stream flows) or short-term (caused by a single stream flow).

De minimis: The least scope, requirement, or interpretation of a law or ruling.

Dendrochronology: The science of dating tree rings. Dendrochronology relies upon cross dating; the process of cross-matching in-common patterns of variability in ring features that are controlled by climate variability to discover calendar dates for individual growth rings.

Department of the Interior (DOI): A Federal Department responsible for administration of public lands not managed by other Federal Departments.

Design Capacity: The maximum theoretical amount of use a developed recreational site was built to accommodate. This is usually expressed in persons at one time.

Desired Condition: A desired state for an ecosystem or ecosystem component that is based on its relationship with other interacting components. Usually implies a long-term goal for management.

Desired Landscape Character: Appearance of the landscape to be retained or created over time recognizing that a landscape is a dynamic and constantly changing community of plants and animals; the combination of landscape design attributes and opportunities, as well as biological opportunities and constraints.

Developed Recreation: This type of recreation is dependent upon facilities provided to enhance recreation opportunities in concentrated-use areas. Examples include campgrounds and picnic areas. Facilities in these areas might include roads, parking lots, picnic tables, drinking water, and toilets.

Developed Recreation Sites: Relatively small, distinctly defined areas where facilities are provided for concentrated public use, such as campgrounds, picnic areas and swimming beaches.

Development Scale:

- Development Scale 1: Minimum site modification. Rustic or rudimentary improvements designed for protection of the site rather than comfort of the users. Use of synthetic materials excluded. Minimum controls are subtle. No obvious regimentation. Spacing informal and extended to minimize contacts

between users. Motorized access not provided or permitted.

- Development Scale 2: Little site modification. Rustic or rudimentary improvements designed for protection of the site rather than comfort of the users. Use of synthetic materials avoided. Minimum controls are subtle, little obvious regimentation. Spacing informal and extended to minimize contacts between users. Motorized access provided or permitted, primary access over primitive roads. Interpretive services are informal, almost subliminal.
- Development Scale 3: Site modification moderate, facilities about equal for protection of natural site and comfort of users. Contemporary, rustic design of improvements is usually based on use on native materials. Inconspicuous vehicular traffic controls usually provided. Roads may be hard surfaced and trails formalized. Development density is about three family units per acre. Primary access may be over high standard roads. Interpretive services informal but generally direct.
- Development Scale 4:Site heavily modified. Some facilities designed strictly for comfort and convenience of users. Luxury facilities not provided. Facility design may incorporate synthetic materials, extensive use of artificial surfacing of roads and trails. Vehicular traffic control is usually obvious. Development density is about three to five family units per acre. Plant materials are usually native. Interpretive services are often formal or structured.
- Development Scale 5: High degree of site modification. Facilities mostly designed for comfort and convenience of users and usually include flush toilets may include showers, bathhouses, laundry facilities and electrical hook-ups. Synthetic materials commonly used. Formal walks or surfaced trails. Regimentation of users is obvious. Access is usually by high-speed highways. Development density is five or more family units per acre. Plant materials may be foreign to the environment. Formal interpretive services usually available. Designs formalized and architecture may be contemporary. Mowed lawns and clipped shrubs are not unusual.

Diameter at breast height (DBH): Tree diameter at a standard height of 4.5 ft (1.37 meters) above the ground surface.

Diffusion model: A model calculated by formula, graphs, or computer that estimates the dilution of an air pollutant as it is carried downwind. The models are based on physical principles with various simplifications to aid solvability.

Dike: A long mass of igneous rock that cuts across a structure of adjacent rock.

Direct attack: Any treatment of burning fuel: by wetting, smothering or chemically quenching the fire or by physically separating the burning from unburned fuel.

Dispersed Campsite: An individual/family-sized campsite that has a general size of about 500-1,000 square feet. It includes a hardened area around a fire pit, a barren area, and/or user-constructed facilities.

Dispersed Recreation: Those forest-oriented outdoor recreation activities that normally take place outside of sites or areas that are developed or managed to concentrate recreational use. Dispersed recreation activities may require facilities for safeguarding visitors, protecting resources and enhancing the quality of visitor experiences.

Distance Zones: Landscape areas denoted by specified distances form the observer. Used as a frame of reference in which to discuss landscape attributes or the scenic effect of human activities in a landscape.

Distinctive Landscape: This corresponds to Scenic Attractiveness Class A. Areas where landform, vegetation patterns, water characteristics and cultural features combine to provide unusual, unique, or outstanding scenic quality. These landscapes have strong positive attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern and balance.

Disturbance: A discrete event or process, either natural or human induced that causes a change in the existing conditions of an ecological system. As used here, disturbances are primarily internal to an ecosystem, established by and influencing principally local ecosystem components (e.g., fire, pathogen outbreaks). Contrast this usage with pertubation that is an event or process that affects biotic components but that originates outside of the system.

Disturbed land: Land where the surface soils or rock or vegetation has been altered.

Diversion dips: Constructed ditches or low spots across the road that allow water to flow across the road during high flow events or in the event that the culvert was plugged to allow the water to be diverted back into the channel, (also drivable dips).

Diversion potential: The potential for water to be diverted away from drainage structures; causing erosion of road surface.

Driving factor: Independent variables that influence ecosystem functions that originates outside of the ecosystem itself. Jenny (1961) recognized at least six-principle driving factors (or state factors) of ecosystem behavior: climate, parent material, topography, regional species availability, humans and time.

Duff: Tree, understory plant needles and leaves that constitute forest floor litter and detritus. Duff includes all soil organic horizons from undecomposed litter to very decomposed organic matter on top of mineral soil.

Ecological processes: The actions or events that link organisms (including humans) and their environment, such as disturbance, successional development, nutrient cycling, productivity and decay.

Ecosystem: The dynamic complex of organisms and their environment contained within a specified area during a specified time. Systemic elements include interaction and feedbacks between components. Note that all ecosystems are open systems, with energy and material flows to and from the system. Hence, spatial and temporal scales of ecosystems must be defined for analysis or the processes by which the biotic and abiotic components of an ecosystem interact and change through time and space. The term ecosystem function is often used in reference to the specific contribution of an ecosystem component to system behavior.

Ecosystem function: A wide range of pertubations and for retention of ecosystem resiliency.

Ecosystem health: A condition in which an ecosystem has the capacity for renewal, for recovery from management.

Ecosystem management: A concept of natural resources management in which human activities are considered within the context of ecological, societal and economic interactions within a defined area over both the short and long term. A major goal in ecosystem management is to sustain ecosystems to meet both ecological and human needs in the future.

Ecosystem patterns: The arrangement of ecosystem components across space and through time.

Ecosystem processes: The mechanisms by which ecosystem components interact and change across space and through time.

Ecosystem resilience: The ability for an ecosystem to restore or maintain biodiversity, ecosystem functions, and ecological structure and processes after a pertubation. Ecosystem resilience implies a return to some stable trajectory or stable rate or type of system dynamics after system pertubation.

Ecosystem structure: The living, and nonliving elements of an ecosystem and their spatial arrangement.

Ecosystem sustainability: The ability to sustain diversity, productivity, resilience to stress, health, renewability and/or yield of desired values, resource uses, products, or services from an ecosystem, while maintaining the integrity of the ecosystem over time.

Ecotonal: Referring to the transition zone between two biotic communities, such as between a ponderosa pine forest and grassland.

Ecotone: The transition zone between two adjacent ecological communities, such as between a ponderosa pine forest and grassland.

Effects (on Heritage Resources): Impacts to the characteristics that qualify a heritage resource for the National Register of Historic Places. These can include alterations in location, setting, use, design, materials, feeling and association. Adverse effects include physical destruction or damage, isolation from or alteration of setting, introduction of visual, audible or atmospheric elements, physical deterioration from neglect or from any action, transfer, lease or sale.

Emission: Unwanted substances released by human activity into air or water.

Emission Control Device: Any piece of equipment that reduces the release of any air pollutant into the atmosphere; see Best Available Control Technology.

Emission Limit: Regulatory standard that restricts the discharge of an air pollutant into atmosphere.

Emission, primary: An emission that is treated as inert (non-reactive).

Emission, secondary: Unwanted substances that are chemical byproducts of reactive primary emissions.

Endangered Species: Any species in danger of extinction throughout all or a significant portion of its range.

Environmental Impact Report (EIR): Environmental impact assessment document prepared in accordance with the California Environmental Quality Act.

Environmental Impact Statement (EIS): Environmental impact assessment document prepared in accordance with the National Environmental Policy Act.

Estuary: Widening area at seaward end of river where its current is met and influenced by ocean tides.

Ethnobotanic: Ethnological information collected from plant types and functions.

Ethnographic landscape: A landscape containing a variety of natural and cultural resources (e.g., contemporary settlements, sacred religious sites, massive geologic structures) that are defined as heritage resources. Small plant communities, animals, subsistence and ceremonial grounds are often components of these landscapes.

Ethnohistoric: Ethnological information collected during historic times for instance that from the Spanish mission registers.

Executive Order: An order of regulation issued by the President or some administrative authority under his or her direction.

Existing Scenic Integrity: This is current scenic condition of the landscape considering previous human alterations.

Experimental Forests: National Forest System lands used for conducting research that serves as the basis for the management of forests and grasslands.

Fault: A fracture or zone of fractures in rock strata which have undergone movement that displaces the sides relative to each other, usually in a direction parallel to the fracture. Abrupt movement on faults is a cause of most earthquakes.

Feature: A visually distinct or outstanding part, quality, or characteristic of a landscape.

Feedback: An interaction between ecosystem components in which variability in or amount of one component is influenced by the effect that it has on another ecosystem component. Feedback interactions may be positive (variability or amount of the first component is increased by the interaction) or negative (variability or amount is decreased by the interaction).

Feeder Pipeline: A short pipeline connecting two petroleum facilities or pipelines.

Fill: Material brought to the site or moved within the site to build up a road surface.

Fine filter management: Management that focuses on the welfare of a single or only a few species rather than the broader habitat or ecosystem (see coarse filter management).

Firebreak: A natural or constructed discontinuity that is utilized to segregate, stop and control the spread of fire or to provide a control line from which to suppress a fire.

Fire regime: The complex of temporal and spatial patterns of fires that occur over specified periods for a given area. Parameters of fire regimes include fire frequency, the amount of area burned, season of fire occurrences, fire severity, fire predictability, and relations with driving factors, such as climate and human activities.

Fire suppression: A coordinated effort to control or put out a fire. A resource management policy initiated in the early 1900s by the U.S. Forest Service after widespread natural occurring wildfires burned hundreds of thousands of acres of public land. Subsequently, this policy was adapted by many other land management agencies. This policy was initiated in order to preserve forest lands has been revised in recent decades as research has shown that fire is a necessary process in the maintenance of healthy forest ecosystems. Prescribed fire and allowing natural fires to burn when conditions are suitable are now widely used management methods.

Firing tactics: Any tactic using fire to help control fire. Backfiring is used to create a wide line of defense at the

head of the fire to halt the forward spread of a fire. Burnout is the removal of small amounts of combustible fuel between the control line and the fire perimeter.

Floodplains: Are relatively flat areas adjoining a river way; which are formed by deposition of sediments during major floods and have evolved with these episodic events; every 50-100 years segments of many of the streams are "re-set" by the large flow events that remove riparian vegetation and re-arrange sandbars, channel banks, riffles and pools.

Forb: A broadleaf plant that has little or no woody material in it.

Foreground: Detailed landscape generally found from the observer to ½ mile away. See also immediate foreground.

Forest canopy: The uppermost layer of vegetation in a forest, which consists of the upper branches of trees.

Forest floor: The surface and ground layer beneath the forest canopy.

Forest Road Atlas: The Forest Road Atlas is a key component of the Forest Transportation Atlas and is consistent with the road inventory includes all classified and unclassified roads on the Forests lands. The road atlas includes; at a minimum, the location, jurisdiction and road management objectives for classified roads and bridges; the location of unclassified roads and management actions taken to change the status of unclassified roads.

Forest roads: Any road wholly or partly within or adjacent to, and serving the National Forest System and which is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

Forest savanna: Low-density stands of trees found on the margins of grassland ecosystems. Often it is a broad ecotone between true grassland and true forest.

Forest Transportation Atlas: The Transportation Atlas is the official repository of transportation facility decisions for the Forests. It contains a current record of Forest transportation facilities. The Forest Service Infrastructure database is used for the storage and analysis of information in the Transportation Atlas.

Forest Transportation Facility: A classified road, designated trail, or designated airfield, including bridges, culverts, parking lots, log transfer facilities, safety devices and other transportation network appurtenances under Forest Service jurisdiction that is wholly or partially within or adjacent to National Forest System lands.

Forest transportation system management: The planning, inventory, analysis, classification, record keeping, scheduling, construction, reconstruction, maintenance, decommissioning and other operations undertaken to achieve environmentally sound, safe, cost-effective, access for use, protection, administration and management of National Forest System lands.

Franciscan rocks: An association of sedimentary rocks and serpentine (including minor asbestos), outcropping along the Big Sur Coast roughly separating the Santa Ynez and San Rafael Mountains, and infamous for being landslide prone.

ft/ft: Feet of elevation change per foot of stream length.

Fuelbreak: A wide strip or block of land on which the native or preexisting vegetation has been permanently modified so that fires burning into it can be more readily extinguished.

Fuel loading: The oven dry weight of fuels in a given area, usually expressed in tons per acre.

Fuels: Plants and woody vegetation, both living and dead, capable of burning.

Fugitive Dust: Airborne pulverized soil particles.

Function: All the processes within an ecosystem through which the elements interact, such as succession, the food chain, fire, weather and the hydrologic cycle.

Gabbro: A dark colored intrusive igneous rock; the coarse-grained equivalent of basalt.

Gallons per day (gpd): A measure of flow rate.

Gallons per minute (gpm): A measure of flow rate.

Gaussian: Diffusion model named after the mathematician Gauss for representing pollution plumes. It is a statistical formulation of pollutant concentration in a downwind direction. The lateral spreading of the pollutants based on wind speed and stability of the atmosphere modified in various ways to take into account presence of an inversion layer and gravitational settling of particles in the plume.

General Scour: Degradation of a channel bed as a result of imbalance of channel sediment-transport capacity and supply during a single stream flow.

Geographic Information Systems (**GIS):** GIS is both a database designed to handle geographic data, as well as a set of computer operations that can be used to analyze the data. In a sense, GIS can be though of as a higher order map.

Geologic hazard: A natural geologic feature or condition that can pose risks to humans, facilities and other resources. Examples include: landslides (many different types), earthquake fault zones, areas of subsidence, collapse or liquefaction, floods, snow avalanches, rocks containing natural toxicity, acid mine drainage, dust, coastal cliff erosion, abandoned mines, abandoned landfills, contaminated groundwater, volcanic activity, etc.

Geologic resource: A naturally occurring geologic feature of scientific, cultural, spiritual or economic value, or a human designation of such features. Examples include: fossils, caves, groundwater, minerals (including oil and gas and geothermal resources, sand and gravel, gemstones, etc.), geologic special interest areas, etc.

Geophysical Survey: General term for survey of land forms using geologist mapping, trenching, soil testing, percolation testing, echo sounding, or other techniques.

Gneiss: Banded metamorphic rock.

Grading: Road surfacing activity to improve drivability, to level or smooth to a desired gradient.

Gram or gravities (g): A unit of acceleration equal to that produced on free falling bodies at the earth's equator.

Granite, Granitic: A coarse granular igneous rock/characteristic of granite.

Ground fire: Fire that burns in fuels on the surface of the ground, such as litter, grasses and other non-woody plants, as well as organic material in the soil layer. Propagates largely by creeping along the ground.

Ground litter: The top layer of the forest floor composed of loose debris of dead branches, twigs, and recently fallen leaves or needles altered little by decomposition.

Groundwater: Water found beneath the surface of the earth within the zone of saturation.

Habitat: The local environment occupied by an organism.

Habitat Conservation Plan (**HCP):** A document required by Endangered Species Act for an incidental take permit application; also known as a Conservation Plan.

Handcrew: A crew consists of 10 to 20 people, whose specialty is constructing fire lines by hand.

Handline: Is a containment line along the edge of a fire built with chainsaws, and hand-tools.

Hardening (a recreation site): The protection of physical resources (usually from recreational impacts) accomplished through a variety of means (such as surfacing, graveling, adding signs, improving drainage, placing barriers or metal fire rings, etc.) that allows continued recreational use of the area.

Hazard Index: Estimated exposure to a given substance being discharged from a facility divided by the acceptable exposure level for that substance summed over all pollutants.

Headwall area: Usually at the top of swales and small channels where the natural upslope progression of a channel ends at a steep vertical face.

Healthy ecosystem: An ecosystem in which structure and functions allow the maintenance of the desired conditions of biological diversity, biotic integrity and ecological processes over time.

Heritage Resources: Are non-renewable evidences of our national heritage. The physical and non-physical remains of districts, sites, structures, buildings, networks, events, or objects used by humans and cultures in the past. Heritage resources are considered to be historic, prehistoric, ethnographic, architectural, or archival in nature.

Heritage Resources Consultation:

- An active, affirmative process that identifies issues and seeks input from appropriate American Indian governments, community groups, and individuals. Considers their interests as a necessary and integral part of the BLM and Forest Service decision-making process.
- The legal obligation requiring the federal government, through consultation, to consider the interests of American Indian tribes and account for those interests in the decision-making process. This legal obligation is based in laws and numerous Executive Orders and statutes.
- A process that involves discussions between a federal agency and the U.S. Fish and Wildlife Service or the National Marine Fisheries Service under Section 7(a)(2) of the Endangered Species Act of 1973, as amended, regarding potential impacts on a species or critical habitat listed under Section 4 of the Act.

Herpetofauna: Biological term for reptiles.

Herpetologist: Person who studies reptiles.

High Scenic Integrity: This classification provides for conditions where human activities are not visually evident. This refers to landscapes where the valued (desired) landscape character “appears” intact. Deviations may be present but must repeat the form, line, color, texture, pattern and scale common to the landscape character. The landscape appears unaltered. This is synonymous with the Retention Visual Quality Objective under the original Visual Management System.

Historical conditions: Range of historical variation; Range of the spatial, structural, compositional and temporal characteristics of ecosystem elements during a period specified to represent "natural" conditions.

Historical range of variability (HRV): A means to define the boundaries of ecosystem behavior and patterns that have remained relatively consistent over long periods. HRV is usually defined for centuries to millennia before the period of widespread human population increases and associated ecosystem changes that began in roughly the early to middle 1800s for many regions of western North America.

Historic Property: Any heritage resource that has been included or determined eligible for inclusion within the National Register of Historic Places.

Holistic: The integration of components of an ecosystem in some scale of ecological inquiry. In a holistic perspective, one ecosystem component cannot be isolated without reference to how it affects and is affected by other components in the system.

Human Dimension: An integral component of ecosystem management that recognizes people are part of ecosystems, that people's pursuits of past, present, and future desires, needs and values (including perceptions, beliefs, attitudes and values) have and will continue to influence ecosystems and that ecosystem management must include consideration of the physical, emotional, mental, spiritual, social, cultural and economic well-being of people and communities.

Hydrocarbons (**HC):** A mixture of hydrocarbon compounds usually referred to in the vapor state**.** Compounds composed principally of carbon and hydrogen; they occur in petroleum, natural gas, coal and bitumens.

- Hydrocarbons, non-methane: Mixture or concentration of hydrocarbons with the methane fraction ignored, one of the many formulations for reactive hydrocarbons.
- Hydrocarbons, Reactive: Mixture or concentration of hydrocarbons with fraction assumed to be non-reactive removed from consideration. See VOC.

Hydrological regimes: The spatiotemporal dynamics of water flow and associated fluvial process in an ecosystem.

Igneous rock: One of the three primary rock groups, composed of rocks formed by cooling of hot magma, that formed at great depth (plutonic rocks), or that extruded onto the surface (volcanic rocks).

Immediate Foreground: The detailed feature landscape found within the first few hundred feet of the observer, generally, from the observer to 300 feet away. This distance zone is normally used in project-level planning, not broad-scale planning.

Imperiled Species: Those plant or animals present in the Plan area and under substantial threats to persistence or distribution from Forest Service activities.

Inboard ditches: Drainage ditches that are located on the uphill side of the road.

Indicator species: A species, the presence or absence of which is indicative of a particular habitat, community, or set of environmental conditions.

Indistinctive Landscape: This corresponds to Scenic Attractiveness Class C. Areas where landform, vegetation patterns, water characteristics and cultural land use have low scenic quality. Often water and rock form of any consequence are missing in these landscapes. These landscapes have weak or missing attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.

Infrastructure database (**INFRA):** Is a Forest Service corporate database application that provides for a consistent and accurate inventory and financial data of Forest Service physical assets on Forest Service lands. Each National Forest enters, manages and reports information on the inventory of their constructed features. Roads, trails, and bridges among other constructed features associated with the transportation system are managed within the Travel Routes application of INFRA.

In-lieu lots: Recreation residence open lots that are made available to special use permit holders to rebuild their structures when lost to fire or other circumstances.

Intactness: Untouched or unaltered, especially by anything that harms or diminishes its character.

Integrated Weed Management (IWM): A system for planning and implementation of a program to select a method for containing or controlling an undesirable plant species or group of species using all available methods including: education, prevention, physical or mechanical methods, biological control agents, herbicide methods, cultural methods and general land management. It uses an interdisciplinary and ecological approach to managing unwanted plants-weeds.

Intermixed Lands: All other lands not included in the Forest Service system lands. They include private, state, local, and other federal lands.

Intrusive: A rock formed at depth from magma emplaced into pre-existing rock.

Invasive nonnative species: Are those animal and plant species with an extraordinary capacity for multiplication and spread at the expense of other native species. Plants in this category may or may not be designated as noxious weeds.

Inversions: A layer of air in the atmosphere in which the temperature increases with altitude at a rate greater than normal (adiabatic). Pollutants tend to be trapped below the inversion.

Invertebrate: Animals that lack a spinal column.

Isobath: A contour line that is at equal depth along its length.

Key Area (Range): A key area is a portion of the range, which because of its location, grazing and browsing value, and/or uses, serves as an indicative sample of rangeland condition, trend, or degree of seasonal use.

km2 or km ^{2} : Square kilometer.

L50 (medium): The level of noise exceeded 50 percent of the time. Usually specified as either the daytime or the nighttime median noise level.

Ladder fuels: Vegetation located below the crown level of forest trees, which can carry fire from the forest floor to tree crowns. Ladder fuels may be low growing tree branches, shrubs, or smaller trees. Fire can move from surface fuels by convection into the crowns with relative ease.

Land management plan ("Forest Plan"): A strategic level document that guides all natural resource management and established management standards for a national forest, and that embodies the provisions of the National Forest Management Act of 1976.

Landform: One of the attributes or features that make up the Earth’s surface such as a plain, mountain, or valley.

Landscape: An area composed of interacting ecosystems that are repeated because of geology, landform, soils, climate, biota, and human influences throughout the area. Landscapes are generally of a size, shape and pattern

that are determined by interacting ecosystems.

Landscape Character: Particular attributes, qualities and traits of a landscape that give it an image and make it identifiable or unique.

Landscape Character Goal: A management prescription designed to maintain or modify the existing landscape character to a desired future state. See desired landscape character.

Landscape Restoration: An activity implemented to restore a landscape to achieve the landscape's assigned Scenic Integrity Objective.

Landslide: A general term covering a wide variety of mass; a movement landforms and processes involving a down-slope movement of rock and soil examples include: debris slide, rock fall, translational slide, block glide, avalanche, mudflow, liquefaction slide, slump, etc.

Lateral Erosion: Horizontal movement of a channel, or a channel widening, caused by water-transport of bank material.

Law Enforcement and Investigations Management Reporting System (LEIMARS): The approved automated system currently in use by the Forest Service for reporting violations of law and of Title 36, Code of Federal Regulations and law violations (FSM 5330).

Level of Service (LOS): A measure of roadway congestion, ranging from A (free flowing) to F (highly congested).

Limits of Acceptable Change (LAC): A framework for establishing acceptable and appropriate resource and social conditions in recreation settings.

Liquefaction: The process of making or becoming liquid (soils).

Litter: The freshly fallen on only slightly decomposed plant material on the forest floor. This layer includes foliage; bark fragments, twigs, flowers and fruit.

Local Scour: Lowering of a channel bed as a result of a local disturbance to flow, such as bridge piers, a sudden drop or a sharp channel bend.

Logger's choice: Also called high grading, it is the selective harvesting of the largest, most highly valued trees in a stand.

Low Flow: Low rate of water flow due to scant rainfall and low runoff.

Low-Flow Incisement: Formation of a local, small channel inside a larger stream channel as a result of low-discharge flows.

Low Scenic Integrity: This classification refers to landscapes where the valued (desired) landscape characters "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative-type changes or architectural styles outside the landscape being viewed. Deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings and structures do not dominate the composition. The landscape appears moderately altered. This is synonymous with the Modification Visual Quality Objective under the original Visual Management System.

Mass Wasting: Large land area erosion and failures.

Macroalgae: Pertaining to large algae, such as kelp, as distinguished from microscopic algae.

Macroinvertebrate: Pertaining to invertebrates that are visible to the naked eye.

Maintenance: The act of keeping fixed assets in acceptable condition. It includes preventive maintenance normal repairs; replacement of parts, and structural components and other activities needed to preserve a fixed asset so that it continues to provide acceptable service and achieves its expected life. Maintenance excludes activities aimed at expanding the capacity of an asset or otherwise upgrading it to serve needs different from, or significantly greater than those originally intended. Maintenance includes work needed to meet laws, regulations, codes and other legal direction as long as the original intent or purpose of the fixed asset is not changed (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998).

Maintenance Levels: Maintenance levels define the level of service provided by, and maintenance required for, a specific road. Maintenance levels must be consistent with road management objectives and maintenance criteria. Roads assigned to maintenance levels 2-5 are either constant service roads or intermittent service roads during the time they are open to traffic.

- Level 1: Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are “prohibit” and “eliminate”.
- Level 2: Assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. Appropriate traffic management strategies are either to discourage or prohibit passenger cars or accept or discourage high clearance vehicles.
- Level 3: Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either “encourage” or “accept”. “Discourage” or “prohibit” strategies may be employed for certain classes of vehicles or users.
- Level 4: Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated. The most appropriate traffic management strategy is “encourage”. However, the “prohibit” strategy may apply to specific classes of vehicles or users at certain times.
- Level 5: Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities. Some may be aggregate surfaced and dust abated. The appropriate traffic management strategy is “encourage”.

Management Indicator Species (MIS): Any species, group of species or species habitat element selected to focus management attention for the purpose of resource production, population recovery, maintenance of population viability or ecosystem diversity.

Management prescription: Management actions and treatments that are implemented under specific environmental conditions to achieve specific desired results.

Marine sedimentary rocks: Sedimentary rocks formed in an ocean environment.

Meaningful measures: A process that helps provide quality service to recreation visitors by setting quality standards for work, prioritizing work by visitor preferences and agreeing to a plan of work consistent with program funding.

Median: The mid-value is a series of values, with half having greater value and half lower value, to be distinguished from “average”.

Mercalli scale: A scale of earthquake intensity ranging from I for an earthquake detected only by seismographs to XII for causing total destruction of all buildings.

Merchantable: A tree with commercial value.

Mesozoic: The Geologic era ranging from 66 to 245 million years ago.

Metamorphic rock: One of the three primary groups of rocks, whereby the rock is derived from pre-existing rocks by mineralogical, chemical, and/or structural changes, in response to marked changes in temperature, pressure, sheering stress and chemical environment, generally at depth in the earth’s crust.

Metasedimentary: Partially metamorphosed sedimentary rock.

Metavolcanic: Partially metamorphosed volcanic rock.

Meter (m): Length equal to 30.48 inches.

Microclimate: Distinctive climate within a small geographic area.

Micron: One millionth of a meter.

Microwave: Radio communications, which are of sufficiently short wavelength (or high frequency) as to be focused on a line-of-sight between sending and receiving equipment. These radio signals carry information for control purposes.

Middleground: The zone between the foreground and the background in a landscape, located from ½ mile to 4 miles from the observer.

Mitigation (for Heritage Resources): To lessen or minimize an adverse effect upon a heritage resource listed on or eligible for inclusion within the National Register of Historic Places.

Mixing Height: The distance from the ground to a daytime (temperature) inversion layer.

Moderate Scenic Integrity: This classification refers to landscapes where the valued (desired) landscape characters "appears slightly altered." Noticeable deviations must remain subordinate to the landscape character being viewed. The landscape appears slightly altered. This is synonymous with the Partial Retention Visual Quality Objective under the original Visual Management System.

Monitoring: The periodic evaluation of management activities to determine how well objectives were met and how management practices should be adjusted. See also, adaptive management.

Monitoring Station: A mobile or fixed site equipped to measure instantaneous or average ambient air pollutant concentrations.

Mortality removal: The removal of dead vegetation including merchantable trees, non-merchantable trees and chaparral.

Multipathway Pollutants: Pollutants that pose a risk to public health through individual inhalation, ingestion (from food, water, or soil) or dermal absorption.

National Forest System (NFS) lands: Federal lands designated by Executive Order or statute as National Forests, National Grasslands, or purchase units or other lands under the administration of the U.S.D.A. Forest Service.

National Forest System road (NFSR): A classified forest road under the jurisdiction of the Forest Service. The term "National Forest System roads" is synonymous with the term "forest development roads" as used in 23 U.S.C. 205.

National Monument: Areas created by law or Executive Order that have unique, ecological, geological, historical, pre-historical, cultural and scientific interest.

National Register of Historic Places: A register of heritage resources of national, state, or local significance that is maintained by the Department of Interior.

National Visitor Use Monitoring (NVUM): Provides sound and statistically reliable estimates of recreation and visitor use within national forests upon which to base land management planning decisions.

National Wild and Scenic River System: Rivers with outstanding scenic, recreational, geological, fish and wildlife, historic, cultural or other similar values designated by Congress under the Wild and Scenic Rivers Act for preservation of their free-flowing condition. See also Wild and Scenic Rivers.

National Wilderness Preservation System: All lands covered by the Wilderness Act and subsequent Wilderness designations, irrespective of the department or agency having jurisdiction.

Native species: Species that have evolved in, or are indigenous to, a specific area.

Natural-Appearing Landscape Character: Landscape character that has resulted from human activities yet appears natural such as historic conversion of native forests into farmlands, pastures and hedgerows that have reverted back to forests through reforestation activities or natural regeneration.

Natural disturbance: Periodic impact of natural events such as: fire, severe drought, insect or disease attack, or wind.

Natural environment: The complex of biotic and abiotic factors that acts on an organism or a community in the absence of significant human intervention.

Natural Landscape Character: Landscape character that originated from natural disturbances, such as wildfires, glaciations, succession of plants from pioneer to climax species, or indirect activities of humans, such as inadvertent plant succession through fire prevention.

Niche: A place or activity for which a thing is best fitted.

Nitric Oxide (NO): A molecule of one nitrogen atom and one oxygen atom. Results usually from combustion of organic substances containing nitrogen and from recombination of nitrogen decomposed in air during high temperature combustion.

Nitrogen Dioxide (NO2): A molecule of one nitrogen atom and two oxygen atoms. Results usually from further oxidation of nitric oxide, (NO) in the atmosphere. Ozone accelerates the conversion.

Nitrogen Oxides (NOx): Poisonous and highly reactive gases produced when fuel is burned at high temperatures causing nitrogen in the air to combine with oxygen. A gaseous mixture: nitric oxide (NO), nitrogen dioxide (NO2) and symbolically represented as NO3.

Noise Level (medium): The level of noise exceeded 50 percent of the time. Usually specified as either the daytime or the nighttime median noise level. Also given the designation L50.

Non-Native American settlement: Extensive and widespread settlement in the western U.S. that began in response to the Homestead Act and other legislation that promoted migration to western lands in the middle to late nineteenth century. Often referred to as Euro-American settlement, also included large numbers of African Americans after the Civil War, Asian Americans from the West Coast and Hispanic Americans from the New World.

Non-native invasive species: Plant species that are introduced into an area in which they did not evolve and in which they usually have few or no natural enemies to limit their reproduction and spread. These species can cause environmental harm by significantly changing ecosystem composition, structure, or processes and can cause economic harm or harm to human health.

Non-native species: Also called alien, invasive and weed species, these species have been introduced by various means into areas where they were not originally found.

Notice of Intent: Formal notice that an EIS will be prepared and considered. Published in the Federal Register. Includes a Proposed Action, the proposed scoping activities, and a contact within the agency who can answer questions about the Proposed Action and the EIS.

Noxious weeds: Are plants species designated as noxious weeds by the Secretary of Agriculture or by a responsible state official, they generally possess one or more of the following characteristics: are aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease and generally non-native. There are regulations and reporting requirements in place to reduce the introduction and spread of noxious weeds.

Nutrient cycling: The transformation of chemical elements from inorganic form in the environment to organic form in organisms and via decomposition back to inorganic form.

Objective: A concise, time-specific statement of measurable planned results that respond to pre-established goals or desired conditions. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.

Occupational Safety and Health AdministrationOSHA: A federal agency regulating the health safety of the work place.

Off-Highway Vehicle (OHV): Vehicles operated or used exclusively off-highway pursuant to Section 38010(a) and as defined in Sections 38006(a) and 38012(a), (b) of the California Vehicle Code. Typical vehicle types are all terrain-vehicles, “dirt bike” motorcycles, snowmobiles and dune buggies. Vehicles registered for use on State highways pursuant to Section 4000 of the California Vehicle Code and are defined as off-highway vehicles

pursuant to Section 38006(b) when used off highway. Typically, all types of four-wheel drive vehicles, Sport Utility Vehicles and dual sport motorcycles.

Off-Road Vehicle (ORV): Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, marsh, swampland, or other natural terrain. (E.O. 11644, 1972)

Off-route impact: The effect of unauthorized vehicle travel off roads and trails on soils, vegetation or other resources. The impact can be a linear feature such as a single motorcycle track or may be larger in scope and can be from a few to many acres in size, such as a vehicle "play" area or a series of hill climbs. Off-route impacts are generally located immediately adjacent to the Forest road and trail systems.

Old growth: Old forests which often contain several canopy layers, variety in tree sizes, species, decadent old trees, and standing and dead woody material.

Open Area: An area that is managed for unrestricted, cross-country vehicle travel both motorized and non-motorized.

Operational Maintenance Level (OML): The type of maintenance required for specific road conditions. Levels are from 1-5, with 5 being the highest amount of maintenance required.

Outfitter/Guide: A special-use permit holder that provides all commercial outfitting operations involving services for accommodating guests, transporting persons, providing equipment, supplies, and materials. The permit holder also provides guiding activities wherein the guide furnishes personal services or serves as a leader or teacher.

Outslope: Roads that are sloped towards the downhill side of the roadway to better match the natural drainage patterns and minimize the potential for diversion.

Overstory: The upper tree canopy layer; the plants below comprise the understory; tree species and their structural patterns in a forest.

Oxidant: A mixture of chemically oxidizing compounds formed from ultraviolet stimulated reactions in the atmosphere, with ozone a principal fraction.

Ozone (O3): A molecule of three oxygen atoms; O3. A principal component of "oxidant" in photo-chemically polluted atmospheres. A colorless gas formed by a complex series of chemical and photochemical reaction of reactive organic gases, principally hydrocarbons, with the oxides of nitrogen, which is harmful to the public health, the biota and some materials.

Paleozoic: The geologic era ranging from 245 to 570 million years ago.

Particulate matter: Very fine sized solid matter or droplets, typically averaging one micron or smaller in diameter, also called "aerosol".

Partnerships: Internal and external relationships that have mutual benefits, bridge communities and engage partners in meaningful ways.

Parts per billion (ppb): A measure of the amount of one substance in a second, which is the carrier.

Parts per million (ppm): Is a measure of concentration that is used where low levels of concentration are significant. The value is equivalent to the absolute fractional amount multiplied by one million.

Parts per thousand (ppt): A chemical concentration used to express the salinity of water.

Pastoral Landscape Character: Landscape character that has resulted from human activities, which contains positive cultural elements such as historic conversion of native forests into farmlands, pastures and hedgerows plus some remnants of native forests.

Patch cut: A silvicultural method where all trees in a localized area is harvested. Patch size varies depending upon the forest type and management goals but is typically 1 to 100 hectares in scale.

Perimeter: The exterior boundary of a fire area.

Persons At One Time (PAOT): A recreational capacity measurement term indicating the number of people who can use a facility or area at one time.

Pertubation: An event or shift in ecosystem properties that causes major disruption to or mortality of ecosystem

components. Pertubation as used in this report is similar to the use of disturbance in other descriptions of ecosystem management plans. However, disturbance as used in this report refers to processes that are endemic to the system itself (e.g., fire), while pertubation implies that the event originates outside of the system (e.g., climate change).

Ph: A measure of acidity or alkalinity.

Photochemical Pollutant: Reactive organic compounds and nitrogen oxides, photochemical pollutants that absorb energy from sun and react chemically to form ozone.

Phytoplankton: Microscopic plants that form the base of the marine/aquatic food chain.

Plant communities: Assemblages of plants that grow together in space and time.

Pluton/plutonic: An intrusive igneous rock body formed at great depth, characteristic of a pluton.

Pounds per square inch (Psig): A unit of pressure.

PM(x)/PM(x): Standards set by the U.S. Environmental Protection Agency to control the amount of particulate matter in the atmosphere that is less than or equal to the amount in (variable indicated in parenthesis) micrometers in diameter.

Prehistoric Site: Archeology sites associated with American Indians and usually occurring before contact with Europeans.

Prescribed fire: A management ignited fire that is set and allowed to burn under prescribed weather and fuel conditions.

Prescribed natural fire: A naturally ignited fire that is allowed to burn under prescribed weather and fuel conditions in prescribed management areas.

Prescribed thinning: The use of mechanical treatments to remove trees from forest stands.

Pre-suppression: Prior to fire suppression, generally speaking, prior to 1930.

Productivity: The amount of biomass produced in an ecosystem or specific subsystems of an ecosystem (e.g., understory productivity) over a given period.

Proposed Action: A proposal made by the Forest Service to authorize, recommend, or implement an action on National Forest System lands to meet a specific purpose and need. The Proposed Action is subject to public notice and comment provisions.

Public roads: Any road or street that is under the jurisdiction and maintained by a public authority and is open to public travel.

Q-curves: This is the ratio of one size class in a distribution of tree diameters compared to the ratio of the next smaller tree diameters.

Raptor: A bird of prey, such as an eagle or hawk.

Reactive Organic Compounds (**ROC):** Organic compounds chemically sensitive to the ultraviolet light in sunlight. See Air Quality.

Record of Decision (ROD): A public document separate from but associated with an Environmental Impact Statement that identifies all alternatives, provides the agency's final decision, the rationale behind that decision, and the agency's commitments to monitoring and mitigation of impacts.

Recreation (Outdoor): Any type of conscious enjoyment that occurs during leisure time; a refreshment of strength and spirits.

Recreation Carrying Capacity: The level of recreation use beyond which impacts exceed social or biological levels specified by evaluative standards.

Recreation Complex: A concentration of developed recreation facilities.

Recreation Opportunity: Availability of a real choice for a user to participate in a preferred activity within a preferred setting in order to realize desired experiences.

Recreational Opportunity Spectrum (ROS): A framework for stratifying and defining classes of outdoor recreation environments, activities and experience opportunities. The settings, activities and opportunities for obtaining experiences are arranged along a continuum or spectrum divided into six classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural and urban.

Recreation Residence: Cabins on National Forest System land that normally were established in tracts and built for recreation purposes with Agency approval and supervision. These cabins are authorized by special-use permit and are not the primary residences of the owners.

Recreation Visitor Day (RVD): Equals to twelve visit hours, which may be aggregated continuously, intermittently, or simultaneously by one or more persons. Recreation visitor days are used to measure recreational production or output capacity.

Reference conditions: Conditions characterizing ecosystem composition, structure, and function and their variability.

Refugia: An area of relatively unaltered climate that is inhabited by plants and animals during a period of continental climatic change (as a glaciation) and remains as a center of relict forms from which a new dispersion and speciation may take place after climatic readjustment.

Research Natural Areas (**RNA):** A physical or biological unit; which current natural conditions are maintained insofar as possible. These conditions are ordinarily achieved by allowing natural, physical and biological processes to prevail without human intervention. However, under unusual circumstances, deliberate manipulation may be utilized to maintain the unique feature that the RNA was established to protect.

Resilience: The ability of an ecosystem to restore or maintain biodiversity, ecosystem functions, and ecological structure and processes after a pertubation.

Restoration: The process of returning ecosystem patterns or processes to a historical range of variability or other defined reference condition.

Right of Way (**ROW):** An area or strip of land to allow access or to allow a utility to pass through public or private lands.

Riparian areas: Found along streams and rivers, including related plant and animal communities.

Riparian dependent resources: Natural resources that owe their existence to the riparian area; such as fish, amphibians, reptiles, fairy shrimp, and other aquatic invertebrates, plants, birds mammals, soil and water.

Riprap: Large rock (generally 8” diameter or larger) used to stabilize slopes or slow down the movement of water. A foundation constructed of broken stones or boulders loosely placed or thrown together, as in deepwater, on a soft bottom, or as a seawall to protect against erosion.

Road: A motor vehicle travel way over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified, or temporary.

- Classified Roads: Roads wholly or partially within or adjacent to National Forest System lands that are determined to be needed for long-term motor vehicle access including State roads, county roads, privately owned roads, National Forest System roads and other roads authorized by the Forest Service.
- Temporary Roads: Roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be a part of the forest transportation system and not necessary for long-term resource management.
- Unclassified Roads: Roads on National Forest System lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travel ways, and off-road vehicle tracks that have not been designated and managed as a trail; and those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization.

Road Analysis: An interdisciplinary science-based analysis of road system opportunities, needs and priorities that support land and resource management objectives.

Road Decommissioning: Activities that result in the stabilization and restoration of unneeded roads to a more natural state.

Road Improvement: Activity that results in an increase of an existing road's traffic service level, expands its capacity, or changes its original design function.

Roadless Area Review and Evaluation (RARE): In 1972, the Forest Service began a review of National Forest System roadless areas (the Roadless Area Review and Evaluation, subsequently called RARE I) to determine their suitability for inclusion in the National Wilderness Preservation System. A second review for Wilderness consideration of roadless areas at the national scale was initiated in 1978 (RARE II).

Roadless Areas: Substantially natural landscapes in national forests that (1) are larger than 5,000 acres or, if smaller, contiguous to a designated Wilderness or primitive area, (2) contain no constructed or maintained roads and (3) has been inventoried by the Forest Service for possible inclusion in the National Wilderness Preservation System.

Road maintenance: The ongoing upkeep of a road that is necessary to retain, or restore the road to the approved road management objective.

Road prism: Cross-section of roadway including cut or fill slopes, subgrade, subbase, surfacing, ditches and other drainage structures.

Road Reconstruction: Activity that results in improvement or realignment of an existing classified road as defined below:

Road Realignment: Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway.

Roads subject to the Highway Safety Act: National Forest System roads that is open to use by the public for standard passenger cars. This includes roads with access restricted on a seasonal basis and roads closed during extreme weather conditions or for emergencies but which are otherwise open for general public use.

Rockform: A significant composition of mineral matter constituting the Earth's crust; one of the attributes or features that make up part of the Earth's surface, such as a mountain, cliff, peak, bluff, valley wall, or bedrock.

Rocking: Replacing of or adding to the road-wearing surface.

Roosting site: A place where avian species or bats spend the night.

Rural/Agricultural Landscape Character: This is a landscape character that has resulted from extensive human activities and which no longer appears natural, such as conversion of native landscapes into extensively cultivated farmlands, vineyards, pastures, or an area of intensive domestic livestock production.

Salvage logging: Logging of dead trees prior to dead trees becoming non-merchantable.

Savanna: An open grassland forest with scattered trees, which often forms a broad ecotone between true grassland and true forest.

Scenery: General appearance of a place, general appearance of a landscape, or features of a landscape.

Scenery Management: The art and science of arranging, planning and designing landscape attributes relative to the appearance of places and expanses in outdoor settings.

Scenery Management System: The USDA Forest Service methodology for classifying the aesthetic values of landscapes are based upon the scenic attractiveness of the landscape, the landscape's visibility and the public's concern about changes in the landscape from a natural condition.

Scenic: Of or relating to landscape scenery; pertaining to natural or natural-appearing scenery; constituting or affording pleasant views of natural landscape attributes or positive cultural elements.

Scenic Attractiveness: The scenic importance of a landscape based on human perceptions of the intrinsic beauty of landform, rock-form, water-form, and vegetation pattern. Reflects varying visual perception attributes of variety, unity, vividness, intactness, coherence, mystery, uniqueness, harmony, balance and pattern. It is classified as: (1) Distinctive, (2) Typical and (3) Indistinctive.

Scenic Integrity: State of naturalness or, conversely, the state of disturbance created by human activities or alteration. Integrity is stated in degrees of deviation from the existing landscape character.

Scenic Integrity Objectives: The objectives that define the minimum level to which landscapes are to be

managed from an aesthetics standpoint. There are six objectives that describe the landscape in varying degrees from naturalness; Very High (Unaltered), High (Appears Unaltered), Moderate (Slightly Altered), Low (Moderately Altered), Very Low (Heavily Altered).

Scenic Quality: The essential attributes of the landscape that when viewed by people, elicit psychological and physiological benefits to individuals and therefore to society in general.

Scenic Resource: Attributes, characteristics and features of landscapes that provide varying responses from and varying degrees of benefits to humans.

Schist: A crystalline metamorphic rock that has closely spaced linear features that tends to split into thin flakes of slabs.

Scoping: Determination of the significant issues to be addressed in an EIS.

Secchi: A measurement of the amount of concentration of suspended solids in the water column. A black and white disc is lowered into the water and the depth at which the disc disappears from view or that point at which only 18% of the surface light penetrates is measured.

Sedimentary rock: One of the three primary rock groups, composed of rocks formed by the deposition of sediment.

Seed tree cut: Removal of the mature timber crop from an area in one cut except for a certain number of trees left singly, in small groups, or in narrow strips as a source of seed for natural regeneration.

Seen Area: The total landscape area observed based upon landform screening. Seen areas may be divided into zones of immediate foreground, foreground, middle ground, background and some landscapes are seldom seen by the public.

Seldom Seen: Remote areas of the landscape that is infrequently viewed by the public or only visible from aerial viewpoints.

Sensitive Receptor: That segment of the population because of age or weak health is more susceptible to the effects of air pollution, noise, oil spill, etc., than the population at large.

Sensitive species: Plant or animal species, which are susceptible to habitat changes or impacts from various kinds of disturbance.

Serpentine: A mechanically weak, green rock, which are susceptible to failure or sliding, particularly on steep slopes.

Shrink-swell potential: Is the expansion or contraction of primarily clay-rich soils during alternating wetting and drying cycles.

Significance: The meaning or value ascribed to a heritage resource based on the National Register of Historic Places evaluation criteria. It normally stems form a combination of association and integrity.

Silviculture: The art and science that promotes the growth of single trees and the forest as a biological unit.

Size class: One of the intervals of tree stem diameters used to classify timber.

Ski Area: A site and attendant facilities expressly developed to accommodate alpine or Nordic skiing and from which the preponderance of revenue is generated by the sale of lift tickets and fees for ski rental, skiing instruction and trail passes, or for the use of permit holder-maintained ski trails. A ski area also may include ancillary facilities directly related to the operation and support of skiing activities. Operation of Nordic and alpine ski areas for up to 40 years and encompassing such acreage as the forest officer determines sufficient and appropriate is authorized by the National Ski Area Permit Act of 1986.

Skiers at one time (**SAOT):** The daily capacity of a ski-based resort.

Slough: Vertical surface layer that is loose and eroding, place of deep mud or mire, bog, a stagnant swamp, backwater, bayou inlet, or pond in which water backs up.

Slumping: Road section failures.

Snags: Standing dead trees that provide important wildlife habitat, especially for cavity-nesting birds.

- Hard Snags: A snag composed primarily of sound wood, generally merchantable.
- Soft Snags: A snag composed primarily of wood in advance stages of decay and deterioration, generally not merchantable.

Soil compaction: A physical change in soil properties that results in a decrease in porosity, and an increase in soil-bulk density and strength: (1) to unite firmly, the act or process of becoming compact; (2) geology, the changing of loose sediment into hard, firm rock; (3) soil engineering, the process by which the soil grains are rearranged to decrease void space and bring them into closer contact with one another, thereby increasing the bulk density; (4) solid waste disposal, the reducing of the bulk of solid waste by rolling and tamping.

Soil erosion: The detachment and movement of soil from the land surface by water or wind. Soil erosion and sediment are not the same. (1) The wearing away of the land surface by rain or irrigation water, wind, ice, or other natural or anthropogenic agents that abrade, detach and remove geologic parent material or soil from one point on the earth's surface and deposit it elsewhere including such processes as gravitational creep and so-called tillage erosion. (2) The detachment and movement of soil or rock by water, wind, ice, or gravity. The following terms are used to describe different erosion types, processes, and mechanisms.

Soil hydrophobicity: Soil that is water repellent, often due to dense fungal mycelial mats or hydrophobic substances vaporized and re-precipitated during fire. Hydrophobic molecules and surfaces have little or no affinity for water molecules. The tendency for a soil particle or soil mass to resist hydration, usually quantified using the water drop penetration time test.

Soil productivity: The inherent capacity of a soil to support the growth of specified plants, plant communities or a sequence of plant communities. Soil productivity may be expressed in terms of volume or weight/unit area/year, percent plant cover or other measures of biomass accumulation is the inherent capacity of a soil to support the growth of specified plants, plant communities or a sequence of plant communities. Soil productivity may be expressed in terms of volume or weight/unit area/year, percent plant cover, or other measures of biomass accumulation.

Special Forest Products (SFP): Renewable products derived from biological resources for personal, educational, commercial, and scientific use. Excludes saw-timber, pulpwood, cull logs, small round wood, house logs, utility poles, minerals, animals, animal parts, rocks, water, and soil.

Special Interest Areas (SIA): Areas of the forest that are managed to protect or enhance their unique characteristics, and where appropriate, to enhance public education and recreation related to those characteristics. SIA's can be established for their botanical, cultural, zoological, paleontological, geological or other values. They can also be established to protect and manage threatened, endangered and sensitive species or other elements of biological diversity.

Species of special interest: Native, nonnative species of plants and animals (e.g., rare and threatened species, invasive weeds) that require special management and monitoring actions.

Special Uses: Improvements or activities owned or carried out by private individuals, corporations or other business entities on National Forest System lands under the authorization of a permit. Examples include organization camps, ski areas, apiaries and water systems.

Stand (forest stand): A group of trees that occupies a specific area and is similar in species, age and condition.

Standard: A performance criterion indicating acceptable norms, specifications or quality that actions must meet to maintain the minimum consideration for a resource. Some standards might apply to all areas of the forest, others only to a specific area (e.g. "place").

Standard Cubic Foot (SCF): A measure of volume or rate of flow of liquid.

State Historic Preservation Officer (SHPO): The SHPO is usually involved in consultation procedures associated with the National Historic Preservation Act of 1966, as amended.

State Implementation Plan (SIP): A document required periodically from each county by EPA that indicates the progress and the planning of the county for improving the quality of its air. See Air Quality.

Stocking level: The number of trees in an area as compared to the desirable number of trees for best growth and management.

Stormproof: Improve drainage patterns to reduce erosion during storm events.

Stream Scour: Lowering of a streambed during the passage of a single stream flow. Stream scour can be local in nature (see Local Scour) or more widespread (see General Scour).

- Local Scour: Occurring at a specific site such as a bridge other stream construction.
- General Scour: Occurring within a stream over long distances due to changes in hydrology controls.

Structure: How the parts of ecosystems are arranged, both horizontally and vertically. Structure might reveal a pattern, or mosaic, or total randomness of vegetation.

Subordinate: Landscape features that are inferior to, or placed below, another in size, importance, brightness and so on. The features that is secondary in visual impact or importance.

Substrate: Geologic term describing soil or geologic layers underlying a project site or construction area.

Succession: A directional composition change in an ecosystem as the available organisms modify and respond to changes in the environment, resulting in changes in the dominant plant and animal species and communities.

Sulfates: Compounds in air or water that contain four oxygen atoms for each sulfur atom. See sulfur Oxides.

Sulfur Dioxide (SO2): a corrosive and poisonous gas produced from the complete combustion of sulfur in fuels.

Sulfur Oxides (**SOx):** The group of compounds formed during combustion or thereafter in the atmosphere of sulfur compounds in the fuel, each having various levels of oxidation, ranging form two oxygen atoms for each sulfur atom to four oxygen atoms. A gaseous mixture of sulfur dioxide (SO2), sulfur trioxide (SO3) and symbolically represented as SOX. It also can include particulate species such as sulfate compounds (SO4).

Surface fire: Fire that spreads through ground fuels with a flaming front.

Sustainability: The ability of an ecosystem to maintain ecological processes and functions, biological diversity and productivity over time.

Sustainable ecosystem: An ecosystem with a balance of processes and components that promote ecosystem resilience and permit the ecosystem to persist into the future in a functional and productive manner.

Terrestrial: Related to or living on land. Terrestrial biology deals with upland areas as opposed to shorelines or costal habitats.

Thinning: Use of mechanical treatments to remove tree biomass from forest stands.

Thinning from below: Removal of all trees from a stand below a certain diameter to favor larger trees in the stand.

Threatened Species: Any species that is likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range.

Total Suspended Particulates (**TSP):** Solid or liquid particles small enough to remain suspended in air. PM10 is the portion of TSP that can be inhaled.

Traditional Cultural Properties (TCPs): An area that is eligible for inclusion in the National Register of Historic Places because of its associations with cultural practices and beliefs of a living community. They are rooted in the community's history and are important in maintaining the continuing cultural identity of the community.

Traffic service level: Describes the significant characteristics and operating conditions of a road.

Transportation Facility Jurisdiction: The legal right to control or regulate use of a transportation facility derived from fee title, an easement, an agreement, or other similar method. While jurisdiction requires authority, it does not necessarily reflect ownership.

Turbidity: Cloudiness or muddiness of water or ocean resulting from suspended or stirred up particles.

Typical Landscape: This corresponds to Scenic Attractiveness Class B. Areas where landform, vegetation patterns, water characteristics and cultural features combine to provide ordinary or common scenic quality. These landscapes generally have positive yet common attributes of variety, unity, vividness, mystery, intactness, order,

harmony, uniqueness, pattern and balance.

ug/m3: Millionths of a gram per cubic meter, a unit of concentration in liquids or gases.

Unacceptably Altered: A scenic integrity level (never an objective) where human activities of vegetation and landform alterations are excessive and totally dominate the natural or natural-appearing landscape character. Unacceptable alterations are "what not to do to any landscape," regardless of the distance from which the management activity may be observed.

Understory: The lower vegetation layers in a forest found beneath the forest canopy including shrubs, grasses, and grass-like plants and forbs.

Undesirable plants: Are plants species that are classified as undesirable, noxious, harmful, exotic, injurious or poisonous pursuant to State or Federal laws; including those designated by the secretaries of Agriculture or the Interior.

Uneven-aged tree selection: The stand created or maintained includes three or more distinctly different age classes.

Upgrade culvert: Increase the size of a culvert to handle larger flows (storm events).

Urban: Landscape character that has resulted from extensive human activities; no long appearing natural such as conversion of native landscapes into an extensively altered landscape such as a town, city or metropolitan area.

Urban Interface (URI): The land use zone identified on maps that is synonymous with the term wildland urban interface.

Urban/wildland interface: That line, area or zone where structures and other human development meet or intermingle with undeveloped wildland.

Variable point sampling: Does not require measurement of the plot radius or tree diameters to compute the basal area per acre. Stem counts are made with each tree tallied contributing equally without regard to diameter, to the basal area estimate.

Variable radius plots: A method to determine tree sizes and densities in forest stands. The radius (limiting distance) of a plot varies by tree sizes and the basal area factor used.

Vernal pools: Are seasonally flooded depressions found on soils with an impermeable layer such as a hardpan, claypan, or volcanic basalt. Vernal pools often fill and empty several times during a rainy season.

Very High Scenic Integrity: This classification generally provides for ecological changes only. This refers to landscapes where the valued (desired) landscape character is intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level. The landscape is unaltered. This is synonymous with the Preservation Visual Quality Objective under the original Visual Management System.

Very Low Scenic Integrity: This classification refers to landscapes where the valued (desired) landscape character, "appears heavily altered." Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative-type changes or architectural styles within or outside the landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings and structures do not dominate the composition. The natural landscape character but should appear as natural occurrences when viewed at background distances. The landscape appears heavily altered. This is synonymous with the Maximum Modification Visual Quality Objective under the original Visual Management System.

Viable population: A species population that has the estimated numbers and distribution of reproductive individuals to ensure its continued existence.

View: Something that is looked toward or kept in sight, especially a broad landscape or panorama. Act of looking toward this object or scene.

Viewshed: Total visible area from a single observer position or the total visible area from multiple observer positions. Viewsheds are accumulated seen-areas from highways, trails, campgrounds, towns, cities or other viewer locations. Examples are: corridor, feature, or basin viewsheds.

Vista: This is a confined view especially one seen through a long passage as between rows of trees or down a canyon which focuses on a specific feature in the landscape. Unlike a view the vista is often human-created and; if it is thereby subject to design.

Waterform: One of the attributes or features that make up the Earth's surface such as a pond, lake, stream, river, waterfall, estuary or ocean.

Watershed: The area contained within a drainage divide above a specified point on a stream.

Water table: the upper surface of the zone of groundwater saturation where all the pore spaces are filled with water.

Weed (or nonnative species): A species introduced into an ecosystem through human activities.

Wetlands: Lands transitional between obviously uplands and aquatic environments. Are areas inundated by surface or groundwater with a frequency sufficient to support vegetation or aquatic life that requires saturated or seasonally saturated soil conditions; wetlands generally include marshes, bogs, wet meadows, river overflows, mud flats and natural ponds. Wetlands are generally highly productive environments with abundant fish, wildlife, aesthetic and natural resource values. For this reason coupled with the alarming rate of their destruction they are considered valuable resources, and several regulations and laws have been implemented to protect them.

Wild and Scenic Rivers (WSR): Rivers or sections of rivers designated by Congressional actions under the 1968 Wild and Scenic Rivers Act as wild, scenic or recreational by an act of the legislature of the state or states through which they flow. See also National Wild and Scenic Rivers System. Rivers may be classified and administered under one or more of the following categories:

- Wild: A river or a section of a river that is free of impoundments with watersheds and is still largely primitive and the shorelines largely undeveloped but accessible in places by roads.
- Scenic: A river or a section of a river that is free of impoundments with watersheds and is still largely undeveloped, but accessible in places by roads.
- Recreational: A river or section of a river that is readily accessible by road or railroad that may have some development along its shoreline and that may have undergone some impoundment or diversion in the past.

Wilderness: An area of undeveloped federal land that Congress designated as Wilderness and that retains its primeval character, and influence without permanent improvements or human habitation and is protected and managed to preserve its natural conditions. An area that; (1) generally appears to have been affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) comprises at least 5,000 acres of land or is of sufficient size to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic or historical value.

Wilderness Implementation Schedule: A document outlining how the Wilderness management direction in a forest plan will be carried out, a three-to-five year schedule of actions that are needed to bring existing conditions into compliance with forest plan standards.

Wildfire: A fire occurring on wildland that has been started by natural agents like lightning.

Wildlife: Native animal species as well as native animal communities.

Wildlife habitat diversity: The distribution and abundance of different plant and animal communities and species within a specific area.

Windthrow: Trees uprooted by wind.

Yellow Post Site: Designated place to disperse camp on the San Bernardino National Forest.

Zooplankton: Microscopic marine/aquatic animals generally carried within a water mass.

Appendix K. Bibliography

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Appendix L - Visitor Use and Participation (NVUM)

Visitor Use

Under the NVUM system, a four-year cycle of data collection was established. In any given year, 25% of the national forests conduct on-site interviews and sampling of recreation visitors. The Angeles National Forest was surveyed in calendar year (CY) 2000, the Cleveland and Los Padres National Forests in fiscal year (FY) 2001. The San Bernardino National Forest is being surveyed in FY 2003. For the purpose of this analysis, visitor use for the San Bernardino was estimated using a process developed by the NVUM National Team.

The following tables display data collected using the NVUM system. Summary of current general visitor use by Forest, which is a measure of the number of people participating in a given activity or using a particular site (see table 421: Summary of current general visitor use by forest).

In a September 2002 NVUM report, it was estimated that 28.7 million national forest visits occurred annually in California and 214 million national forest visits nationwide. The average national forest visit was made up of 1.2 site visits thus producing 256.2 million national forest site visits. An additional 215 million people view National Forest lands from non-Forest Service managed roads and waterways outside the Forests, highlighting the role of scenery and tourism.

Many southern California national forest visitors participated in some form of day-use recreation, with average site visits that ranged from 5.7 to 9.8 hours. The national average for length of a national forest visit is considerably longer than that, at slightly under 19 hours (NVUM).

Most visitor race/ethnicity has been identified by recent NVUM research for the four southern California national forests as being White; however, a strong component of Spanish, Hispanic and Latino families are present, along with a growing use by Asians and Pacific Islanders. Most use is by urban southern California male visitors (NVUM).

See table 422: Predominant Race/Ethnicity, Gender, and Age of Forest Visitors

Nationally, 92% of Forest visitors are White, 70% are men, and almost 50% are between the ages of 31 and 50.

A recent study (Richer, 2002) indicated that fewer White (Caucasian) race/ethnicity visit the Angeles (56%) and San Bernardino (55%) National Forests and considerably more Hispanic (Latino) 25% and 32% visit, respectively, than indicated by the NVUM data. Most visitors are male (ranging between 65% at the San Bernardino and 74% at the Los Padres National Forests). Most visitors are between the ages of 20 and 49, and have either graduated from college or completed some college coursework. The median household size ranges between two and four, and median household income is between $47,500 and $52,500.

See also the “Socio-demographic Profiles for Outdoor Recreation Visitors” section of the Socioeconomic Assessment in this DEIS for visitor profiles and management implications.

Information received from the four southern California forests during the fall of 2002 (Forest Meetings, 2002) indicated that, as might be expected, some areas were more intensively visited than others. The most intensively visited Places were often those near the major urban centers, especially lower elevation canyons with streams. Other popular Places were in the high country, refuges from heat, smog and urban stress. These Places included the Front Country (San Gabriel and Big Tujunga Canyons), High Country and Uplands in the Angeles NF; Figueroa-Santa Ynez (Santa Ynez Canyon) and Hungry Valley-Mutau in the Los Padres NF; Laguna (Mount Laguna) in the Cleveland NF; and the Front Country (Forest Falls winter use and Thurman Flats) and Big Bear in the San Bernardino NF. While some Places remain remote and receive relatively little visitation, most Places have increased visitation since the last Plans were approved. Forest meeting feedback also highlighted the importance of the seasonality of use, with most people still visiting in the summer months from Memorial Day to Labor Day, especially weekends and holidays. However, visitation (especially trail use) is increasing in the “shoulder” seasons of March through May and September through November. In addition, favorable weather conditions can generate heavy, often spontaneous weekend visitation for snow play and to winter resorts.

Visitor Participation

Based on the NVUM information, table 423: Five Most Popular Activities by Forest by Percent Participation presents a summary of the most popular activities on each of the four Forests.

This southern California information mirrors national activity patterns reported from NVUM. Nationally, the five most popular recreation activities were viewing natural features (52% of National Forest visits include this activity), general relaxing (45%), viewing wildlife (38%), hiking (36%) and driving for pleasure (23%). Of course, there is much variance between types of visitors to different forests in different regions of the country.

The National Survey of Recreation and the Environment (NSRE), 2000 - 2001, the Nation's on-going, long-term outdoor participation and environmental/public lands survey, provides further important recreation participation information at the market area, state, and national levels. For the southern California national forest market area, major recreation participation activities are:

- Walking for pleasure - 77%
- Family gathering - 72%
- Visit nature centers, etc - 55%
- View/photograph natural scenery - 54%
- Picnicking - 52%

Over 96% of Californians participated in at least one outdoor activity during the year 2000. Walking is the most popular activity, although others are growing fast and joining the ranks of activities Californians most favor including day hiking, bicycling, and viewing birds, fish and wildlife. Nationally, visitors most enjoy walking, family gatherings, picnicking, nature centers, and sightseeing.

Per recreation visitor contact studies (Chavez, 2001), the main activities (in order from most to least mentioned) of southern California survey respondents were found to be:

- Picnic
- Relax
- Day hike
- Enjoy or play in the water
- Off-road ride
- Sightsee
- Car camp
- Family gatherings

Responses were influenced by the sites selected and the opportunities afforded by those sites. The primary activities were often site-specific. People go to outdoor recreation sites for benefit outcomes (e.g., improved social condition or family bonding) or for experiences (e.g., solitude and relaxation). The majority of respondents were on repeat visits. Differences between racial and ethnic groups were found in how activities were done (e.g. picnicking). Other studies indicate group size differs by race and ethnicity (Chavez 1992, Carr and Chavez 1993, Chavez 2001).

Table 425: Primary Purpose of Visit (% participation) and table 426: Visit Characteristics displays the primary purpose for and characteristics of visits to southern California national forests, per the Recreation Fee Demo monitoring program by Richer, 11/25/02.

Visitor Satisfaction

Visitor satisfaction with their recreation experience was recently rated, in general terms, by NVUM for Developed Day and Overnight Use Sites and General Forest Areas. Most visitors rate the majority of satisfaction items on the Angeles, Cleveland and Los Padres National Forests as being in the good to very good range for the values

they feel most strongly about.

The California State Parks Report of 1998 stated that 60% of Californians are satisfied with outdoor recreation areas and facilities currently available. Based on latent (unmet) demand and public support, Californians believe that nine outdoor recreation activities should have top priority for the expenditure of public funds: walking, trail hiking, camping in developed sites, camping in primitive sites, general nature study, use of open grass areas, picnicking in developed sites, visiting museums/historic sites, and visiting zoos/arboretums. Not all of these opportunities occur on NFS lands.

This report also examined differences between Hispanics and members of all other ethnic groups. It indicated that Hispanic visitors (as compared with visitors of other race/ethnicity) are more likely to use and prefer highly developed areas. They also demonstrate more support towards special programs (such as for the elderly and people with disabilities) and are comparatively more likely to be concerned with regulation of behavior in parks and outdoor recreation areas.

Appendix M - Civil Rights Impact Analysis

As per Departmental Regulation 1010-1 dated July 3, 1996, a civil rights impact analysis was conducted regarding the proposed land management plan revision of the Angeles, Cleveland, Los Padres, and San Bernardino National Forests. There will be no reduction or significant change in service to the public and no permanent positions eliminated, or significant relocation of employees.

Proposed Action. The four southern California National Forests (Angeles, Cleveland, Los Padres, San Bernardino) propose to implement a fifteen year forest plan that will provide guidelines and alternatives in the management and use of public forest lands under the management and protection of the USDA, Forest Service in Southern California.

The Cleveland National Forest has identified alternative 2 as the 'preferred alternative' for the draft forest land management plan. Alternative 2 retains all existing access, programs and activities. The other three forests, the San Bernardino, the Angeles, and the Los Padres, have identified alternative 4 as the 'preferred alternative' for the draft forest land management plan. Alternative 4 increases access to lands, programs and activities, emphasizing recreational use.

The four southern California forests held initial public meetings (with Spanish translation available) to gain the public's input regarding forest use and access. Additional public meetings were held (with Spanish translation available) to present proposed management alternatives.

Public meeting notices on all four forests have included statements that the Forest Service would provide accommodations for persons with disabilities. For public meeting locations where significant numbers of Spanish speaking individuals might be present, each forest ensured that Spanish translation was available.

Civil Rights Impacts of the Proposed Action. The proposed actions present no identifiable negative civil rights impacts to employees or the public. There are no management actions in the preferred alternatives included in the land management plans that will negatively impact the public's access or use of forest land, programs or activities. There are no alternatives included in the land management plans that affect employment or positions.

There were no comments resulting from the public meetings that the proposed land management plans would have any negative impact on the use of and access to forest land, programs or activities that would affect any individual or class of individuals identified by race, sex, national origin, gender, religion, age, disability, political beliefs, sexual orientation, marital or family status.

Recommendation and Monitoring Actions. It is recommended that when implementing a selected alternative identified in the plan that the forest managers monitor public use to mitigate and/or correct any unforeseen negative civil rights impact on affected people. Due to the high percentage of diverse people in southern California, it is also recommended that the forests consider nontraditional people and their cultural use of forests land, providing any pertinent information regarding access to land, programs and activities in bilingual format pursuant to Executive Order 13166, Limited English Proficiency, and proposed 7 CFR 15(g).

CERTIFICATION OF CIVIL RIGHTS DIRECTOR

As the agency's principal Equal Opportunity (EEO) official, the Director of Civil Rights is responsible for administering a full range of EEO and Title VI programs. The Director provides advice and technical guidance on civil rights matters to the USDA Forest Service, Forest Supervisors and other agency management officials. This is certification that the Director of Civil Rights was actively involved in the planning and implementation of the forest land management plan proposal.

Sandra Macias

Director, Civil Rights

USDA Forest Service, Region 5

Appendix N - San Dimas Experimental Forest

Experimental forests and ranges provide lands for conducting research that serves as a basis for the management of forests and rangelands.

The San Dimas Experimental Forest (SDEF) is a protected field laboratory under the joint management of Pacific Southwest Research Station and the Angeles National Forest for studies of hydrology, fire, and other topics relating to the ecology of chaparral and related ecosystems. Located in the San Gabriel Mountains north of Glendora, it covers 17,163 acres and has been closed to the general public, except under special written permit, since establishment in January 1933.

The San Dimas Experimental Forest is also a Biosphere Reserve under UNESCO's Man and the Biosphere Program. It contains the 1,370-acre Fern Canyon Research Natural Area (RNA). The Williams Fire burned through most of the SDEF in September 2002, destroying several experimental plots and structures. Most of the buildings at the Tanbark Flats headquarters were saved, but the plant cover and instrumentation at the lysimeters # unique in-ground facilities originally built to measure water movement through the soil # were mostly lost. The archived soil samples taken when the lysimeters were filled in 1937, and the building that housed them, were also lost. The Pacific Southwest Research Station and Angeles National Forest will implement the Joint management plan for the SDEF, which will be tiered to the land management plan revision. The link to the SDEF and management plan is located at the web page:

http://www.rfl.psw.fs.fed.us/prefire/sdefhtml/sdefmanplan.html.

There are a number of other uses within the SDEF, including 17 recreation residences in the Main and West Fork San Dimas tracts, several apiaries, and a communications site. These uses are authorized by special use permit and access is controlled.

The primary objective at the San Dimas Experimental Forest is long-term environmental monitoring. This includes the elements of:

- Climate and weather
- Stream-water discharge
- Stream-water nitrate concentration and discharge
- Remote sensing
- Avian populations
- Soil erosion
- Vegetation biomass

The experimental forest will be managed to retain important scientific research values according to its Establishment Record, management plan and land management plan.

Finish this:

No additional experimental forests are being proposed in the land management plan revision; nor is any reduction in size or elimination of the existing SRSJMNM. Because direction for this Monument is detailed in law, regulation, agency policy and in a specific management plan, administration will not vary by alternative.

Experimental Forest Background and Status

Background and Status

Experimental forests and ranges provide lands for conducting research that serves as a basis for the management of forests and rangelands.

The San Dimas Experimental Forest (SDEF) is a protected field laboratory under the joint management of Pacific Southwest Research Station and the Angeles National Forest for studies of hydrology, fire, and other topics relating to the ecology of chaparral and related ecosystems. Located in the San Gabriel Mountains north of Glendora, it covers 17,163 acres and has been closed to the general public, except under special written permit, since establishment in January 1933.

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- Climate and weather
- Stream-water discharge
- Stream-water nitrate concentration and discharge
- Remote sensing
- Avian populations
- Soil erosion
- Vegetation biomass

The experimental forest will be managed to retain important scientific research values according to its Establishment Record, management plan and land management plan.

No additional experimental forests are being proposed in the land management plan revision. The San Dimas Experimental Forest would be reduced in size in alternatives 2 and 3 due to recommended wilderness.