

“Cumulative impact” is the aggregation of all direct and indirect impacts and/or effects on a resource over time in a given area, regardless of the land ownership (Federal, State, or Private).

This cumulative effects report and the attached soil survey, analyze the cumulative effects to the soil resource in terms of *detrimental soil compaction* from harvesting equipment.

The existing condition and future cumulative effects to the soil resource, within harvest units, were analyzed for the Pipeline Cumulative Effects Area (CEA), which is the Placer Creek Compartment -739 (map on page 4-26 of the Pipeline EA). Cumulative effects may occur when existing soil disturbances from past activities are further affected by the proposed activities. Most soil disturbance is associated with the construction and use of landings and skid trails. Landings and skid trails *may have* reduced soil productivity from compaction and/or displacement of surface soil depending on the following factors:

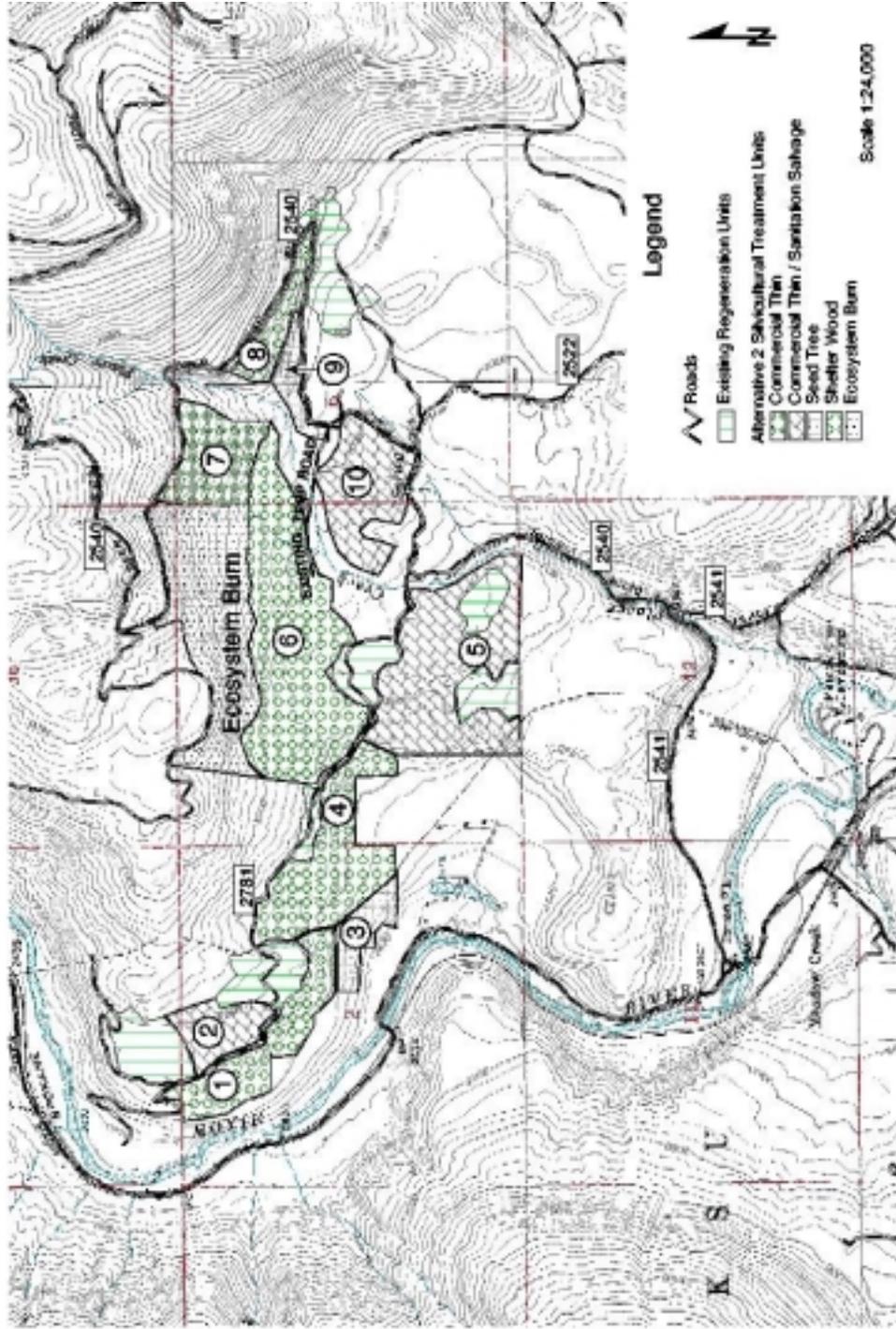
- The moisture content and soil type;
- The rock content in the soil;
- The type of harvest equipment used;
- The number of passes made on a skid trail;
- The depth of the overlaying slash mat or snow on the trail; and the fact that frozen soils resist compaction.

Soils - Past Activities and Existing Condition

An aerial photo of the past harvesting activities in the Pipeline analysis area can be seen on page 4-24 of the Pipeline EA. The timber sale activities were:

- Complacer C Thin Timber Sale of 1992,
- Orser Creek Timber Sale of 1990
- Pipeline Timber Sale of 1983.

Pipeline Project Area (Alternative 2)



- Alternative 2 (Proposed Action) is the preferred alternative.

Existing Soil Compaction

The following tables display the cumulative impacts from the three previous timber sales (1983-1992) and the estimated impacts to the soil resource for all alternatives in the Pipeline analysis area. Notice that the existing detrimental soil compaction values are low compared to the Regional Soil Quality Standards, and, after the proposed vegetation restoration activities the values are still low.

Alternative 1 (No Action) - Impacts to the Soil Resource

UNIT	UNIT SIZE (acres)	HARVEST SYSTEM	EXISTING DETRIMENTAL COMPACTION (%)	ADDITIONAL DETRIMENTAL COMPACTION AFTER * TREATMENT (%)	CUMULATIVE DETRIMENTAL COMPACTION (%)	REGIONAL SOIL QUALITY STANDARDS (%)
1	49	Cable	2	0	2	< 15
2	25	Ground	7	0	7	< 15
3	19	Cable/Ground	2	0	2	< 15
4	72	Cable/Ground	2	0	2	< 15
5	115	Cable/Ground	4	0	4	< 15
6	141	Ground	5	0	5	< 15
7	42	Cable	0	0	0	< 15
8	24	Cable	5	0	5	< 15
9	14	Ground	0	0	0	< 15
10	54	Ground	5	0	5	< 15

* The No Action alternative would gradually decrease surface soil compaction over time because natural disturbances such as vegetation root systems, rodents, and frost, acting individually and together, would break up the compacted layers in the soil (Froelich, 1985).

Alternative 2 - Impacts to the Soil Resource

UNIT	UNIT SIZE (acres)	HARVEST SYSTEM	EXISTING DETRIMENTAL COMPACTION (%)	ADDITIONAL DETRIMENTAL COMPACTION AFTER * TREATMENT (%)	CUMULATIVE DETRIMENTAL COMPACTION (%)	REGIONAL SOIL QUALITY STANDARDS (%)
1	49	Cable	2	2	4	< 15
2	25	Ground	7	1	8	< 15
3	19	Cable/Ground	2	1	3	< 15
4	72	Cable/Ground	2	1	3	< 15
5	115	Cable/Ground	4	1	5	< 15
6	141	Ground	5	1	6	< 15
7	42	Cable	0	2	2	< 15
8	24	Cable	5	1	6	< 15
9	14	Ground	0	2	2	< 15
10	54	Ground	5	1	6	< 15

Alternative 3 - Impacts to the Soil Resource

UNIT	UNIT SIZE (acres)	HARVEST SYSTEM	EXISTING DETRIMENTAL COMPACTION (%)	ADDITIONAL DETRIMENTAL COMPACTION AFTER * TREATMENT (%)	CUMULATIVE DETRIMENTAL COMPACTION (%)	REGIONAL SOIL QUALITY STANDARDS (%)
1	49	Cable	2	2	4	< 15
2	25	Ground	7	1	8	< 15
3	19	Cable/Ground	2	1	3	< 15
4	72	Cable/Ground	2	1	3	< 15
5	115	Cable/Ground	4	1	5	< 15
6	141	Ground	5	1	6	< 15
7	42	Cable	0	2	2	< 15
8	24	Cable	5	1	6	< 15
9	14	Ground	0	2	2	< 15
10	54	Ground	5	1	6	< 15

*Skid trails exist in Units 1,2,5,6,9 and 10. Additional detrimental soil compaction will be negligible for the following reasons:

- a) Existing landings and skid trail patterns will be used which provide access to most of the area within the Units. Extensions or branches from existing skid trails will be incidental.
- b) By estimating the impacted area of probable skid trail extensions, the additional detrimental impact to soils in the Units is projected to be 0-2% per Unit area.
- c) Detrimental soil compaction is also minimized by running equipment over frozen or rocky soils, a snow layer > 18", or a slash mat in the skid trails. These practices will be used in the implementation of the Pipeline EA.
- d) Future harvest will not exceed Regional or Forest Plan soil quality standards because of the unique rocky nature of these soils and due to the fact that future harvest will stay mostly on existing trails. It is unlikely that future harvest will increase detrimental soil impacts much beyond existing levels (Niehoff, 2001).

Ecosystem burning – Impacts to the soil resource from the ecosystem burn will be marginal because no soil compacting equipment will be used. Burning will most likely occur in the spring when soil moisture levels are greater than 25 percent, therefore keeping the risk of detrimental soil heating to a minimum and thus detrimental changes to the soil structure and chemistry are unlikely as stated in the R-1 Soil Guidelines.

Ongoing and Reasonably Foreseeable Activities

Federal Land - Present activities on federal land, which comprises of 90 percent of the ownership within the Pipeline CEA, have inconsequential effects on the soil resource. Activities in the Pipeline CEA are huckleberry picking, hunting, and firewood gathering. Other cumulative effects from activities such as pre-commercial thinning are listed in chapter four of the Pipeline EA. Road 2541 is gated year around, so access is limited to the few handicap hunters in the fall, PGT pipeline maintenance personnel, and Crown Pacific personnel. Activities in the PGT pipeline right-of-way (ROW) have been the addition of a gas line, installed in the early 1990s and tree/grass planting. An EIS for another gas line to be installed in their ROW is in progress and the proposed future activities will be outlined in the pending document. The Crown Pacific land was harvested (seed tree cut) in the early 1990's and no further activities are anticipated. Elsewhere in the CEA, firewood gathering is limited to within a few hundred feet of road 2540. Equipment such as pickups or skidders are prohibited off the main road prism and firewood is gathered by hand, therefore, on federal land, *there are inconsequential direct, indirect or cumulative effects to the soil resource from activities within the Pipeline CEA.*

Private Land - As a measure of perspective, private land makes up 10 percent of the area within the Pipeline CEA. Most detrimental soil compaction on private land (i.e. forest conversion to pastures, grazing, and tractor logging) occurred years ago and is part of the existing condition. The Idaho Department of Lands checked their records to see if the any landowners in the Pipeline CEA had filed any logging activity permits since the issuing of the previous Decision Notice on 4/20/01. No logging permits have been filed to date (personal communication with Eric Haase – IDL). Consequentially, *no measurable detrimental soil impacts have occurred since 4/20/01 and no further detrimental soil impacts to the soil resource are expected from the private sector within the Pipeline CEA.*

Future Soil Compaction-Second Entries

No second entries are planned in Units 1, 3, 4, 6, 8, and 9. In about 20 years, Units 2,5 and 10 are scheduled to have a second entry to regenerate the stands. In following entries, *the same designated skid trails and landings will be used, so an additional 0-2 percent of each of the harvest Units may be detrimentally impacted. Therefore the detrimental cumulative effects to the soil resource will be small and well under the R-1 Soil Quality Standards of 15 percent.*

The conclusion of this cumulative effects report and the attached soil survey, demonstrate that there has been *some* detrimental soil compaction in the Pipeline CEA from past activity. There is a small possibility of increasing detrimental soil compaction by 0-2%, on a Unit-by-Unit basis, given the Pipeline EA is implemented. However, future harvest will not exceed Regional or Forest Plan soil quality standards because of the unique rocky nature of these soils and due to the fact that future harvest will stay mostly on existing trails. It is unlikely that future harvest will increase detrimental soil impacts much beyond existing levels (Niehoff, 2001). Therefore, there are little to no negative direct, indirect, or cumulative impacts to the soil resource within the Pipeline CEA.