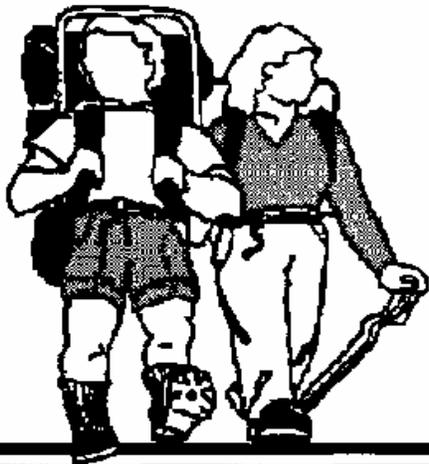


# Abbreviations and Acronyms

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Olympic National Forest

## ABBREVIATIONS AND ACRONYMS

\* Term is defined in Glossary

AA	Analysis Area *
Ac.	Acre *
ADT	Average Daily Traffic *
AF	Acre-Foot *
AMS	Analysis of the Management Situation *
ASQ	Allowable Sale Quantity *
AW	All-Terrain Vehicle *
AUM	Animal Unit Month *
BA	Botanical Area *
BEMA	Bald Eagle Management Area *
BF	Board foot *
BIA	U.S. Bureau of Indian Affairs
BLM	U.S. Bureau of Land Management *
BMP	Best Management Practices *
BTU	British Thermal Unit *
CC	Clearcut *
CCC	Civilian Conservation Corps
CEQ	U.S. Council on Environmental Quality *
CF	Cubic Feet *
CFL	Commercial Forest Land *

CFR	U.S. Code of Federal Regulations *
CFS	Cubic feet per second
CMAI	Culmination of Mean Annual Increment *
CRM	Cultural Resource Management
CRT	Cultural Resource Technician
CSYU	Cooperative Sustained Yield Unit
CT	Commercial Thinning
DBH	Diameter at Breast Height *
DEIS	Draft Environmental Impact Statement *
DFSIM	Douglas-fir Growth and Yield Simulator
DNR	Washington State Department of Natural Resources
DOE	Washington State Department of Ecology or Department of Energy
DSEIS	Draft Supplement to the Environmental Impact Statement for an Amendment to the Pacific Northwest Regional Guide (Spotted Owl Guidelines)
EA	Environmental Analysis or Environmental Assessment *
EIS	Environmental Impact Statement *
EPA	Environmental Protection Agency *
EVC	Existing Visual Condition *
FERC	Federal Energy Regulatory Commission
FEIS	Final Environmental Impact Statement *
FIL	Fire Intensity Level *

FMAS	Fire Management Analysis System
FMEI	Fire Management Efficiency Index
FORPLAN	FOrest PLANning Model *
FSEIS	Final Supplement to the Environmental Impact Statement (See DSEIS)
FSH	Forest Service Handbook *
FSM	Forest Service Manual *
FSYU	Federal Sustained Yield Unit *
F&WL	Fish and Wildlife
GIS	Geographic Information System
GWh	Gigawatt hours (of energy) *
HCI	Habitat Capability Index *
HCRS	Heritage Conservation and Recreation Service
HCV	High Clearance Vehicle
HEI	Habitat Effectiveness Indices
HQI	Habitat Quality Index *
ICO	Issues, Concerns and Opportunities *
IDT	Interdisciplinary Team *
IPM	Integrated Pest Management *
IRAA	Integrated Resource Analysis Area *
KV	Knudson-Vanderberg
LAC	Limit of Acceptable Change *
LOD	Large Organic Debris *

LTSYC	Long-Term Sustained Yield Capacity *
M	Modification *
M	Thousand
MAI	Mean Annual Increment *
MBF	One Thousand Board Feet
MCF	One Thousand Cubic Feet
MM	Maximum Modification *
MM	Million
MMBF	One Million Board Feet
MMCF	One Million Cubic Feet
MOU	Memorandum of Understanding *
MPN	Most Probable Number
MR	Management Requirement *
MSH	Maximum Sustained Harvest
NAS	National Accounting System
NDF	Nondeclining Flow (of timber volume) *
NEPA	(The) National Environmental
NF	National Forest *
NFMA	(The) National Forest Management Act *
NFS	National Forest Systems *
NOVA	Non-Highway Off-Road Vehicle Activity
NRT	National Recreation Trail *
NTU	Nephelometric Turbidity Unit
OG	Old-Growth (timber)
ONF	Olympic National Forest

ONP	Olympic National Park
ORV	Off-Road Vehicle *
P	Preservation *
PAOT	Persons At One Time (Capacity) *
PCT	Precommercial Thinning *
PETS	Proposed Endangered, Threatened or Sensftive Species
PNV	Present Net Value *
PPM	Parts per million
PR	Partial Retention *
R	Retention *
RAM	Resource Allocation Model *
RARE II	The Second Roadless Area Review and Evaluation *
RD	Ranger District
RIM	(Forest Service) Recreation Information Management (system) *
R.M.	River Mile
RNA	Research Natural Area *
RO	Regional Forester's Office (Forest Service)
ROD	Record of Decision *
ROS	Recreation Opportunity Spectrum *
RPA	The (U.S.) Forest and Rangeland Renewable Resources Planning Act*
RVD	Recreation Visitor Day *
R/W	Right-of-Way *

S&Gs	Standards and Guidelines
SCORP	The Washington Statewide Comprehensive Outdoor Recreation Plan
SCSYU	Shelton Cooperative Sustained Yield Unit *
SHPO	Washington State Historic Preservation Officer, or the State of Washington Office of Archaeology and Historic Preservation.
SMU	Streamside Management Unit *
SO	Supervisors Office (National Forest)
SOHA	Spotted Owl Habitat Area *
SPS	Stand Projection System
SRI	Soil Resource Inventory *
STARS	Sale Tracking and Reporting System
T&E	Threatened and Endangered Species *
T,E&S	Threatened, Endangered and Sensitive Species
TFW	Timber, Fish and Wildlife for non-Federal lands in the State of Washington
TIS	Transportation Inventory System
TSI	Timber Stand Improvement *
TSP	Total Suspended Particulates *
TSPIRS	Timber Sale Program Information Reporting System
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
VAC	Visual Absorption Capacity *
VQO	Visual Quality Objective *

WC	Working Circle *
WDF	Washington State Department of Fisheries
WDW	Washington State Department of Wildlife
WFUD	Wildlife and Fish User Day *
WIZ	Water Influence Zone *
WNH	Washington State Natural Heritage
WRS	Wilderness Resource Spectrum *
W&SRA	Wild and Scenic Rivers Act

# Glossary

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Olympic National Forest

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## GLOSSARY

Many of the definitions in this glossary are referenced to the following sources. The sources are identified by a number in parentheses following most glossary definitions. The glossary definition number corresponds to the list below. Some other terms will be referenced to Forest Service Manuals (FSM), Forest Service Handbooks (FSH), or other sources which are too numerous to list. Finally, many other definitions are not referenced, but are those in general use on the Forest.

### SOURCE LIST

- (1) 36 CFR 219 National Forest Management Act Regulations
- (2) Regional Guide for the Pacific Northwest Region, 1984.
- (3) Forestry Terminology, A Glossary of Technical Terms Used in Forestry, Society of American Foresters 1971.
- (4) The Random House College Dictionary, Revised Edition, 1975.
- (5) Webster's New International Dictionary, 1957.
- (6) Wildland Planning Glossary, Pacific Southwest Forest and Range Experiment Station, USDA Forest Service, General Technical Report PSW 13/1976.
- (7) Webster's Third New International Dictionary, 1981.
- (8) Wildlife Habitats in Managed Forests, The Blue Mountains of Oregon and Washington, 1979.
- (9) A Glossary of Terms Used in Range Management
- (10) Forest Service Manual or Forest Service Handbook.
- (11) A Dictionary of Statistical Terms, Third Edition, M.G. Kendal and W. R. Buckland.
- (12) An Approach to Water Resources Evaluation of Non-Point Silvicultural Sources (CA Procedural Handbook), Environmental Protection Agency, Report #EPA-IAG-D6-0660, 8/80.
- (13) Ecology Field Glossary - A Naturalists Vocabulary, Walter H. Lewis
- (14) Eric Forsman, Consulting Wildlife Biologist, Olympia WA
- (15) Glossary of Engineering Terms, Pacific Northwest Forest and Range Experiment Station, USDA Forest Service, 1979.
- (16) Management of Wildlife and Fish Habitats in Forest of Western Oregon and Washington, USDA Forest Service, Pacific Northwest Region, 1985.
- (17) National Forest Landscape Management, Volume 2, the Visual Management System, Chapter 1.
- (18) New American Dictionary.
- (19) Random House Dictionary of the English Language, College Edition, 1969.
- (20) Webster's New Collegiate Dictionary.

## A

**Abnormally heavy storms** - Storms with a 10-to 100-year return period. That is, a 10-year storm occurs on the average of once every 10 years, a 20-year storm occurs on the average of once every 20 years, and so forth.

**Access** - Usually refers to a road or trail route over which a public agency claims a right-of-way for public use; a way of approach. (4)

**Acquired lands** - Lands added to the National Forest system by purchase, transfer, or donation under authority of the *Weeks Law* or related acts. Also, lands obtained by the Forest Service by exchange for other acquired lands.

**Acre (Ac.)** - A unit of area of land measurement equal to 43,560 square feet. (20)

**Acre equivalent** - Used to adjust actual acres of habitat improvement or improvement structures to reflect overall habitat benefits derived it reflects the zone of influence of the habitat improvement for the benefiting species. (2)

**Acre-foot (AF)** - A measure of water or sediment volume, equal to the amount which would cover an area of one acre to a depth of one foot (i.e., 43,560 cubic feet or 325,851 gallons). (6)

**Activity** - An action, measure or treatment undertaken that directly or indirectly produces, enhances, or maintains forest and rangeland outputs, or achieves administrative or environmental quality objectives (FSM 1309, Management information Handbook). An activity can generate multiple outputs. (2)

**Activity fuels** - Fuels generated or altered by a management activity. (10)

**Administrative site** - Buildings and other facilities which are used in the management of a National Forest.

**Administrative unit** - An area under the administration of one line officer, such as a District Ranger, Forest Supervisor, or Regional Forester. (6)

**Aerial logging system** - A timber yarding system employing aerial means, e.g., balloons or helicopters, to lift the log or logs. (3)

**Age class** - The average age of a timber stand, usually expressed in decades. (3)

**Age group distribution** - Age class distribution; the location and/or proportionate representation of different age classes in a forest. (3)

**Airshed** - A geographic area that, because of topography, meteorology, and climate, shares the same air. (2)

**Allocation** - See *Land Use Allocation or Resource Allocation*.

**Allotment** - Usually associated with grazing permits. A permitted area for grazing a specified number of cows, sheep, or horses for a special duration.

**Allowable sale quantity (ASQ)** - The quantity of timber that may be sold, from the area of suitable land covered by the Forest Plan, for a time period specified by the Plan. This quantity is usually expressed on an annual basis as the “average annual allowable sale quantity.” (6) (1)

**All-terrain vehicle (ATV)** - A vehicle characterized by its ability to negotiate most kinds of terrain, by virtue of traction devices such as wide tracks, large, low-pressure rubber tires and/or four-wheel drive.

**Alternative** - One of several policies, plans, or projects proposed for decision making. (2) (10)

**Amenity** - An object, feature, quality, or experience that gives pleasure or is pleasing to the mind or senses. The terms “amenity values” or “amenity resources” are typically used in land management planning to describe those resources for which monetary values are not or cannot be established (such as clean air and water, or scenic quality).

**Anadromous fish** - Those species of fish that mature in the sea and migrate into streams to spawn. Salmon, steelhead, and sea-run cutthroat trout are examples.

**Analysis area (AA)** - A delineated area of land--subject to analysis of: (1) responses to proposed management practices in the production, enhancement, or maintenance of forest and rangeland outputs and environmental quality objectives, and (2) economic and social impacts. (FSM 1905) Tracts of land with relatively homogeneous characteristics in terms of the outputs and effects that are being analyzed in the FORPLAN model. (See FEIS Appendix B, Section entitled “Development of Analysis Areas.”)

**Analysis of the management situation (AMS)** - A determination of the ability of the planning area to supply goods and services in response to society’s demand for those goods and services. (6)

**Animal Unit Month (AUM)** - The amount of forage required by one mature (1,000 lb.) cow or its equivalent for one month (based upon average forage consumption of 26 lbs. dry matter per day). Animal Month is one month’s use and occupancy of the range by one animal. For grazing fee purposes, it is a month’s use and occupancy of range by one weaned or adult cow with or without calf, bull, steer, heifer, horse, burro, or mule, or five sheep or goats. (6)

**Annual sale quantity (ASQ)** - The quantity of timber that may be sold annually from the area of suitable land covered by the Forest Plan (See also *Allowable Sale Quantity*.)

**Anomalies** - A deviation from the common rule, type, or form. An incongruity or inconsistency. (4)

**Appropriated funds** - Monies authorized by an act of Congress which permit Federal agencies to incur obligations and to make payments out of the U.S. Treasury for specified purposes.

**Aquaculture** - The cultivation of the natural produce of water. An example is commercial oyster cultivation (20)

**Aquatic ecosystems** - Stream channels, lakes, marshes or ponds, and the plant and animal communities they support.

**Aquifer** - A geological formation or structure that contains water in sufficient quantity to supply needs for water development. (6)

**Artifact** - An object made or modified by humans. (4)

**Assigned values** - Monetary values given to nonmarket resources, based on estimates from comparable market transactions. For example, the benefits of dispersed recreation are given assigned monetary values for their production.

**Association (wildlife)** - A group of wildlife species whose requirements for habitat are satisfied by similar successional stages within given plant communities.

**Available latest land** - Land which has not been legislatively or administratively withdrawn by the Secretary of Agriculture or Forest Service Chief from timber production.

**Average Daily Traffic (ADT)** - The average 24-hour volume of traffic, being the total volume of traffic during a stated period divided by the number of days in that period. (6)

## B

**Background** - See *Distance Zone*.

**Bald Eagle Management Areas (BEMAs)** - Areas managed for the protection of the bald eagle. BEMA's provide nesting, roosting and foraging habitat for the bird on each plot.

**Basal area** - The area of the cross-section of a tree stem near the base, generally at breast height and inclusive of bark. (3)

**Base sale schedule** - A timber sale schedule formulated on the basis that the quantity of timber planned for sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade, and this planned sale and harvest for any decade is not greater than the long-term sustained yield capacity. (This definition expresses the principle of nondeclining flow.) (1)

**Basic resource** - One of the principal resources: a resource upon which the production of other resources is dependent: e.g., the production of vegetation is dependent upon basic resources such as soils and water.

**Benchmark** - The analytical basis from which the alternatives were developed. The use of assessed land capability as a basis from which to estimate the effects of alternative patterns of management on the land. (6)

**Benchmark** - Reference points that define the bounds within which feasible management alternatives can be developed. Benchmarks may be defined by resource output or economic measures.

**Benefit (value)** - Inclusive terms used to quantify the results of a proposed activity, project or program expressed in monetary or nonmonetary terms. (10) Also:

1. *Direct benefit*. A primary benefit that responds to specified objectives of the policy, program, project, or expenditure. (10)
2. *Induced benefit*. A primary benefit that is incidental to the objectives of the policy, program, project, or expenditure. (10)

3. *Primary benefit.* A benefit accruing to resource owners from a primary output and that may be direct or induced or may be a residual asset. Primary benefits are components of net public benefits. (10)
4. *Secondary benefit.* A benefit accruing to parties other than the resource owners, including effects on local, Regional, and national economies and consumers. Secondary benefits are not necessarily included in net public benefits. (10)

**Benefit/cost ratio** - A measure of economic efficiency computed by dividing total discounted primary benefits by total discounted economic costs. (10)

**Best Management Practices (BMP)** - A practice or combination of practices that is determined by a State (or designated area-wide planning agency) after problem assessment, examination of alternative practices, and appropriate public participation, to be the most effective, practicable (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (Federal Register, Volume 40, No 230 dated 11/28/75).

**Big game** - Large mammals hunted for sport On the National Forest these include animals such as deer, elk, and bear. (8)

**Big game summer range** - An area, usually at higher elevations, used by deer and elk during the summer. Summer ranges are usually much more extensive than winter ranges. (8)

**Big game winter range** - An area, usually at lower elevations, used by migratory deer and elk during the winter months: usually more clearly defined and smaller than summer ranges. (8)

**Biological control** - A method to control insect populations or tree diseases through the use of applied technology. Also used in noxious plant control. (3)

**Biological growth potential** - The average net growth attainable in a fully stocked natural forest stand. (1)

**Biological potential** - The maximum production of a selected organism that can be attained under optimum management. (8)

**Biomass** - The total quantity (at a given time) of living organisms of one or more species per unit of space (species biomass), or of all the species in a biotic community (community biomass).

**Biosphere** - The part of the world in which life can exist including parts of the lithosphere, hydrosphere and atmosphere. (7)

**Slowdown** - A tree or trees uprooted or felled by wind.

**Board foot (BF)** - The amount of wood equivalent to a piece of wood one foot by one foot by one inch thick. (3)

**Board foot/cubic foot conversion ratio** - Both board foot and cubic foot volumes can be determined for timber stands The number of board feet per cubic foot of volume varies with tree species, diameter, height, and form factors. A specific factor by species is applied to the cubic foot FORPLAN outputs to give board foot estimates.

**Botanical Area** - A designated area which contains specimens or groups of plants, and plant communities which are significant because of form, color, occurrences, habitat, location, life history, arrangement, ecology, environment, rarity and/or other features.

**British Thermal Unit (BTU)** - The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at or near 39.2 degrees F. (20)

**Broadcast burn** - A prescribed fire over a designated area within well-defined boundaries for reduction of fuel hazard or as a silvicultural treatment, or both.

**Browse** - Twigs, leaves, and young shoots of trees and shrubs on which animals feed; in particular, those shrubs which are used by big game animals for food. (6)

**Brush** - A growth of shrubs or small trees usually of a type undesirable to livestock or timber management.

**Bureau of Land Management (BLM)** - An agency within the Department of the Interior, with land management responsibility for the Public Domain lands.

## C

**Cable logging** - Refers to methods used to skid or pull logs to a central landing or collection area by a cable connected to a remote power source. (6)

**Canopy** - The more-or-less continuous cover of branches and foliage formed collectively by the crown of adjacent trees and other woody growth. (3)

**Capability** - The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices at given levels of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils and geology, as well as the application of management practices, such as silviculture or protection from fire, insects, and disease. (1)

**Capability area** - Geographic delineations used to describe characteristics of the land and resources in integrated forest planning. Capability areas may be synonymous with ecological land units, ecosystems, or land response units. (10)

**Capital formation** - Used in IMPLAN as the value of purchases from sectors both inside and outside the Region by individuals, governments, and industries in the area as investment (land, plant, and equipment used in production processes). (10)

**Capital investment** - Activities that create or improve capital assets for desired benefits during several planning periods. (10)

**Carrying capacity** - 1) The number of organisms of a given species and quality that can survive in, without causing deterioration of, a given ecosystem through the least favorable environmental conditions that occur within a stated interval of time. 2) In recreation, refers to the number of people that can occupy an area for a given social and experience goal. 3) In range, refers to the maximum stocking rate possible on a given range without causing deterioration to vegetation or related resources. (3)

**Cavity** - The hollow excavated in trees by birds or other natural phenomena; used for roosting, food storage, and reproduction by many birds and mammals. (2)

**Cavity-dependent species** - A wildlife species that digs or chips out cavities in wood to provide itself or its mate with a site for nesting, roosting, or foraging. (16)

**Channel or stream scour** - Erosion of the channel bottom caused by high flows of water, loss of channel stability, or debris torrents.

**Characteristic landscape** - In reference to the USDA Forest Service visual management system; the overall impression created by a landscape's unique combination of visual features (land, vegetation, water, structures), as seen in terms of form, line, color and texture; synonymous with 'visual landscape character. (6)

**Chargeable volume** - All timber volume included in the growth and yield projections for the selected management prescriptions used to arrive at the allowable sale quantity, based on regional utilization standards. (10)

**Clearcut (CC)** - The cutting method that describes the silviculture system in which the old crop is cleared over a considerable area at one time. Regeneration then occurs from (a) natural seeding from adjacent stands, (b) seed contained in the slash or logging debris, (c) advance growth, or (d) planting or direct seeding. An even-aged forest usually results. (3)

**Climatic regimes** - A generalized climatic classification which applies to a specific land area; generally that area can be expected to experience that kind of climate in any given year.

**Climax** - The culminating stage in plant succession for a given site where the vegetation has reached a highly stable condition. (6)

**Climax species** - Those species that dominate a climax stand in either numbers per unit area or biomass.

**Closure** - An administrative order restricting either location, timing, or type of use in a specific area.

**Coastal Douglas-Fir Zone** - The area west of the crest of the Cascade Mountain Range in the States of Oregon and Washington.

**Code of Federal Regulations (CFR)** - A codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government. (1)

**Commercial Forest Land (CFL)** - 1. Historical use in Timber Management (TM) Plans. Forest land that is capable of producing commercial crops of wood not withdrawn from timber use by statute or administrative regulation; includes areas suitable for management to grow crops of industrial wood and generally capable of producing in excess of 20 cubic feet per acre of annual growth; includes both accessible and prospectively accessible areas and both operable and prospectively operable areas. 2. Definition in revised TM Handbook. Land that is producing, or is capable of producing, crops of industrial wood and (1) has not been withdrawn by Congress, the Secretary of Agriculture, or the Chief of the Forest Service; (2) land where existing technology and knowledge is available to ensure timber production without irreversible damage to soil productivity or watershed conditions, and (3) land where existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that adequate restocking can be obtained within 5 years after final harvesting.

**Commercial thinning** - Any type of tree thinning that produces merchantable material at least equal in value to the direct costs of harvesting. (3)

**Commodities** - A transportable resource with commercial value; all resource products that are articles of commerce. (6)

**Common varieties** - Nonmineralized sand, gravel, stone, etc. (See *Mineral Materials*.)

**Community Cohesion**-The degree of unity and cooperation evident in a community as it defines problems and attempts to resolve them. (10)

**Community Group** - An aggregation of individual communities having similar types and patterns of lifestyle and values related to Forest management.

**Community stability** - A community's capacity to handle change without major hardships or disruptions to component groups or institutions. Measurement of community stability requires identification of the type and rate of proposed change and an assessment of the community's capacity to accommodate that level of change. (10)

**Compaction** - The packing together of soil particles by forces exerted at the soil surface, resulting in increased soil density.

**Composite** - A reference to special planning areas designated under the Land and Water Conservation Act of 1965; an area identified for unique recreation and/or fish and wildlife values.

**Composite Plan** - A documented analysis which, at one time was required to justify the use of Land and Water Conservation Funds for acquisition of private lands within a designated composite.

**Concern** - A point, matter, or question raised by management that must be addressed in the planning process.

**Condition class** - 1) Timber: a grouping of timber strata into size-age-stocking classes for Forest planning. 2) Range: one of a series of arbitrary categories used to classify range conditions, usually expressed as excellent, good, fair, or poor. (9)

**Congressionally Classified and Designated Areas** - Areas that require congressional enactment for their establishment, such as Wildernesses, National Wild and Scenic Rivers, and National Recreation Areas.

**Conifer** - A tree belonging to the most important order of the Gymnospermae, comprising a wide range of trees that are mostly evergreens. Conifers bear cones (hence coniferous) and needle-shaped or scale-like leaves and produce timber known commercially as softwood. (3)

**Constraint** - In FORPLAN, a limit (either ceiling or floor) which may be placed on the level of inputs to or outputs from a forest.

**Consumptive use** - A use of resources that permanently reduces the supply, such as mining. (See also *Nonconsumptive Use*). (6)

**Conversion period** - The duration of a change from one silvicultural system to another or from one tree species to another. (3)

**Core area** - An area (as related to the spotted owl) encompassing at least 300 contiguous acres of old growth suitable for nesting and reproduction. The area consists of a pair's territory, in part, the nest site, and principal roost areas.

**Corridor** - A linear strip of land identified for the present or future location of transportation or utility rights-of-way within its boundaries. (1)

**Cost, capital investment** - The cost of manmade structures, facilities, or improvements in natural resources used as inputs in production processes to produce outputs over one or more planning periods. (FSM 1905)

**Cost-effective** - Achieving specified outputs or objectives under given conditions for the least cost. (6)

**Cost-efficiency** - The usefulness of specified inputs (costs) to produce specified outputs (benefits) in measuring cost efficiency, some outputs, including environmental, economic, or social impacts, are not assigned monetary values, but are achieved at specified levels in the least costly manner. Cost efficiency is usually measured using present net value, although use of benefit-cost ratios and internal rate-of-return may be appropriate. (1)

**Costs** -

1. *Direct cost.* A cost that directly contributes to the production of primary outputs of an activity, project, or program. (10)
2. *Economic cost.* Total fixed and variable costs for inputs, including costs incurred by other public parties and, if appropriate, opportunity costs and cost savings. (10)
3. *Fixed cost.* A cost that is committed for the time horizon of planning or the decision being considered. Fixed costs include fixed ownership requirements, fixed protection, short-term maintenance, and long-term planning and inventory costs. (10)
4. *Investment cost.* A cost of creating or enhancing capital assets, including costs of administrative or common-use transport facilities and resource management investments. (10)
5. *Joint cost.* A cost contributing to the production of more than one type of output. (10)
6. *Non-Forest Service cost.* A cost of investment and operating activities paid by cooperators or other non-Forest Service agencies which are part of Forest Service management programs, or which contribute to the outputs included in the analysis. (10)
7. *Opportunity cost.* The value of a resource's foregone net benefits in its most economically efficient alternative use. (10)
8. *Unit cost at cost per unit.* Total cost of production divided by the number of units produced. (10)
9. *Variable cost.* A cost that varies with the level of controlled outputs in the time horizon covered by the planning period or decisions being considered. (10)

**Cost sensitivity analysis** - A type of analysis done to estimate how a particular problem's solution would change if the costs were increased or decreased.

**Council on Environmental Quality (CEQ)** - An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters. (Abstracted from the National Environmental Policy Act of 1969, as Amended.)

**Cover/forage ratio** - The mixture of cover and forage areas on a unit of land, expressed as a ratio.

**Created opening** - An opening in the Forest created by the silvicultural practices of: final removal harvest of shelterwood; clearcutting; seed tree cutting; or group selection cutting. (2)

**Crown height** - In a standing tree, the vertical distance from ground level to the base of the crown, measured either to the lowest live branch whorl, or to the lowest live branch (excluding shoots arising spontaneously from buds on the stem of a woody plant), or to a point halfway between. (3)

**Cubic foot (CF)** - The amount of timber (or water) equivalent to a piece of wood (or water) one foot by one foot by one foot. (3)

**Culmination of mean annual increment (CMAI)** - The age at which average annual growth is greatest for a stand of trees. Mean annual increment is expressed in cubic feet measure, and is based upon expected growth according to the management intensities and utilization standards assumed in accordance with 36 CFR 219.16(a)(2)(i) and (ii). Culmination of mean annual increment includes regeneration harvest yields and any additional yields from planned intermediate harvests. (10)

**Cultural resource** - The remains of sites, structures, or objects used by humans in the past—historic or prehistoric. (2)

**Cumulative effects or impacts** - Cumulative effect or impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CR 1508.7 - these regulations use effects and impacts synonymously.)

**Current Direction Alternative** - This term is often used interchangeably with the “No Action” Alternative required by the National Environmental Policy Act. It is Alternative A in this EIS.

**Cutting cycle** - The planned lapse of time between successive cuttings in a stand. (6)

## D

**Data** - Any recorded measurements, facts, evidence, or observations reduced to written, graphical, tabular, or computer form. The term implies reliability, and therefore provides an explanation of source, type, precision and accuracy. (6)

**Debris slide** -- A shallow landslide of soil, rock, and organic material that occurs on steep slopes.

**Debris torrent** - A large debris slide that is charged with water and confined to a steep stream channel. Debris torrents may travel several thousand feet.

**Decadent (stands)** - Decaying; deteriorating. (4)

**Decision Criteria** - Essentially the rules or standards used to evaluate alternatives. They are measurements of indicators that are designed to assist a decision maker in identifying a preferred choice from an array of possible alternatives.

**Deer winter range** - See *Big Game Winter Range*.

**De facto outputs** - Resource outputs produced from lands not necessarily being managed or allocated for the specific production of these outputs. De facto resource outputs are most commonly recreation and wildlife opportunities. For example, an area may not be allocated to emphasize recreation management and, in fact, may be scheduled for timber harvest in a later decade. However, the area can usually continue to provide recreation opportunities until it is entered for harvesting.

**De facto supply** - In dispersed recreation, those acres that are available for timber harvests but not entered.

**Demand** - The amount of an output that users are willing to take at a specified price, time period, and condition of sale. (10)

**Demand Analysis** - A study of the factors affecting the schedule of demand for an output, including the price-quantity relationship, if applicable. (10)

**Department of Energy (DOE)** - A department of the Executive branch of the Federal Government which oversees national matters involving the development and use of energy.

**Departure** - A schedule which deviates from the principle of nondeclining flow by exhibiting a planned decrease in the timber sale and harvest schedule at any time in the future. (10)

**Dependent communities** - Communities whose social, economic, or political life would change in important respects if market or nonmarket outputs from the National Forests were substantially altered.

**Designated Area (Air Quality)** - Those areas delineated in the Washington Smoke Management Plan as centers of air quality concern.

**Design standard** - Approved design and construction specifications used mainly for recreation facilities and roads—includes specified materials, colors, dimensions, etc.

**Desirable residual vegetation** - The remaining vegetation after application of harvest cutting methods that meets management area objectives. The vegetation may be trees, shrubs, grass, or a combination.

**Developed recreation** - Recreation that requires facilities that, in turn, result in concentrated use of an area. Examples of developed recreation areas are campgrounds and ski areas; facilities in these areas might include roads, parking lots, picnic tables, toilets, drinking water, ski lifts, and buildings. (2)

**Developed recreation site** - Relatively small, distinctly defined areas where facilities are provided for concentrated public use; e.g., campgrounds, picnic areas, swimming areas, and downhill ski areas. (6)

**Developed Site Management Schedule** - A document identifying management direction for operating and maintaining developed recreation sites and their facilities.

**Diameter at breast height (DBH)** - The diameter of a tree measured 4 feet 6 inches above the ground. (6)

**Discount rate** - An interest rate that represents the cost or time value of money in determining the present value of future costs and benefits. A “real” discount rate is one adjusted to exclude the effects of inflation. (6) (10)

**Discounting** - An adjustment, using a discount rate, for the value of money over time so that costs and benefits occurring in the future are reduced to a common time, usually the present, for comparison. (6) FSM 1905

**Dispersed recreation** - Synonymous with undeveloped recreation. A general term referring to recreation use outside developed recreation sites, this includes activities such as scenic driving, hiking, backpacking, hunting, fishing, snowmobiling, horseback riding, cross-country skiing, and recreation in primitive environments. (2)

**Distance zone** - One of three categories used in the Visual Management System to divide a view into near and far components. The three categories are:

1. *Foreground* - The visible terrain between the observer and middleground. The detailed landscape found within 0 to 1/4 to 1/2 mile from the observer. (6)
2. *Middleground* - The visible terrain between the foreground and background. The area located from 1/4 to 1/2 to 3 to 5 miles from the observer. (6)
3. *Background* - The visible terrain beyond the middleground where individual trees are not visible, but are blended into the total fabric of the stand. The view beyond 3 to 5 miles from the observer, and as far as the eye can detect objects. (6)

**Diversity** - The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan. (2) (1)

**Doghair stand** - Excessively overstocked and stagnated timber stands occupying substantial areas of potentially productive forest land on the east side of the Olympic National Forest.

**Douglas-fir Type** - An association of tree species in which Douglas-fir is recognized as one of the principal seral species.

**Draft Environmental Impact Statement (DEIS)** - The draft statement of environmental effects which is required for major federal actions under Section 102 of the National Environmental Policy Act, and released to the public and other agencies for comment and review. (6)

**Dry Ravel** - The slow to very rapid gravity driven movement of dry soil. Dry ravel usually occurs when the organic materials in the surface layers of the soil are severely altered by fire. Dry ravel occurs most likely where soils are medium to coarse textured and slopes are over 60 percent gradient.

**Duff** - Organic matter in various stages of decomposition on the floor of the forest. (4)

## E

**Early forest succession** - The early stage or condition of a plant community that occurs during its development from bare ground to climax. (6)

**Eastside Zone** - The portion of the Olympic National Forest that includes the Hood Canal and Quilcene Ranger Districts.

**Economic efficiency** - The usefulness of inputs (costs) to produce outputs (benefits) and effects when all costs and benefits that can be identified and valued are included in the computations. Economic efficiency is usually measured using present net value, though use of benefit-cost ratios and rates-of-return may sometimes be appropriate. (10)

**Economic growth** - Increased economic output in real terms overtime. (6)

**Economic impacts** -

1. *Direct economic impact.* Effects caused directly by forest product harvest or processing or by forest uses. (10)
2. *Indirect economic impact.* Effects that occur when supporting industries sell goods or services to directly affected industries. (10)
3. *Induced economic impact.* Effects that occur when employees or owners of directly or indirectly affected industries spend their income within the economy. (10)

**Ecosystem** - An interacting system of organisms considered together with their environment; for example, marsh, watershed, and lake ecosystems. (2)

**Edge** - An area where plant communities meet or where successional stages or vegetation conditions within the plant communities come together. (2)

**Effects** - Environmental changes resulting from a proposed action included are direct effects, which are caused by the action and occur at the same time and place, and indirect effects, which are caused by the action and are later in time or further removed in distance, but which are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Effects and impacts as used in this FEIS are synonymous. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic quality, historic, cultural, economic, social, or healthy effects, whether direct, indirect, or cumulative. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effects will be beneficial. (40 CFR 1508.8; 2)

**Electronic sites** - Formally-designated areas of National Forest System land suitable for the location of electronic communication equipment. Equipment may include: receive-only passive reflectors, antennas, satellite dishes, etc, or transmit/receive facilities for two-way radio, microwave, and AM-FM broadcast characterized by continuous transmission when operating.

**Employment** - Labor input into a production process, measured in the number of person-years or jobs. A person-year is 2,000 working hours by one person working year long or by several persons working seasonally. (10)

**Endangered species** - Any species of animal or plant that is in danger of extinction throughout all or a significant portion of its range. Plant or animal species identified by the Secretary of the interior as endangered in accordance with the 1973 Endangered Species Act. (6)

**Endemic Plant** - A plant confined to a certain country or region and with a comparatively restricted geographic distribution.

**Ending Inventory Constraint** - The standing volume left in the inventory at the end of the planning horizon. The constraint insures that there is enough standing inventory at the end of the planning horizon to perpetuate long-term sustained yield capacity harvest levels on a nondeclining flow basis.

**Enhancement** - A short-term management practice having the specific purpose of increasing the positive aspects of a resource, such as enhancing scenic variety where little variety now exists.

**Environment** - The aggregate of physical, biological, economic, and social factors affecting all organisms in an area.

**Environmental Analysis (EA)** - A comprehensive evaluation of alternative actions and their predictable short- and long-term environmental effects, which include physical, biological, economic, social, and environmental design factors and their interactions. (2)

**Environmental Assessment (EA)** - The concise public document required by the regulations for implementing the procedural requirements of the National Environmental Policy Act. (40 CFR 1508.9; 2)

**Environmental Consequences** - The effects upon a given environment as a result of a proposed action.

**Environmental Impact Statement (EIS)** - A statement of the environmental effects of a proposed action and alternatives to it. It is required for major federal actions under Section 102 of the National Environmental Policy Act (NEPA), and released to the public and other agencies for comment and review. It is a formal document that must follow the requirements of NEPA, the Council on Environmental Quality (CEQ) guidelines, and directives of the agency responsible for the project proposal. (6)

**Environmental Protection Agency (EPA)** - An agency of the Executive Branch of the Federal Government which has the responsibility for environmental matters of national concern.

**Ephemeral draw** - A drainage way which conveys surface water for short periods of time in direct response to snowmelt or rainfall runoff.

**Erosion** - (1) The wearing away of the land surface by running water, wind, ice, or other geologic agents, including such processes as gravitation creep; or (2) detachment and movement of soil or rock fragments by water, wind, ice, or gravity. The following terms are used to describe different types of erosion:

*Accelerated erosion* - Erosion which is much more rapid than natural erosion, with the increase in erosion rate resulting primarily from the influence of human activities, or, in some cases, of other events that expose mineral soil surfaces, such as wildfire.

*Gully erosion* - The erosion process whereby water accumulates in narrow channels, and over short periods, removes the soil from this narrow area to considerable depths, ranging from 4 inches to as much as 75 to 100 feet.

*Fill erosion* - An erosion process in which numerous small channels less than 4 inches deep and 6 inches wide are formed.

*Sheet erosion* - The removal of a fairly uniform layer of soil from the land surface by runoff water.

**Erosion Hazard Rating** - A rating system (low, medium, and high) which denotes the susceptibility of a land area to surface and mass wasting erosional processes.

**Escapement** - The numbers of adult anadromous fish that successfully escape commercial and sport fishing pressure and return to their streams of origin to spawn.

**Estuary** - A semiclosed body of water which has a free connection with the open sea. The sea water in an estuary is measurably diluted with fresh water from streams, rivers, or ground water.

**Eutrophic** - Of habitats, particularly soils and water, that are rich or adequate in nutrients. (3)

**Even-aged management** - The application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together. Managed even-aged forests are characterized by a distribution of stands of varying ages (and, therefore, tree sizes) throughout the forest area. The difference in age between trees forming the main canopy level of a stand usually does not exceed 20 percent of the age of the stand at harvest rotation age. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desired age or size for regeneration and is harvested. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands. (1)

**Even-aged stands** - Stands in which all trees are about the same age. (A spread of 10 to 20 years is generally considered one age class.) Cutting methods producing even-aged stands are clearcut, shelterwood, or seed tree systems.

**Exchange reserved** - Lands which have been added to the National Forest System by exchange under the General Exchange Act for reserved/proclaimed National Forest System Lands.

**Existing visual condition (EVC)** - An inventory of existing visual impacts as seen from sensitive travel corridors or use areas; measures visual changes to the landscape caused by natural or human activities.

**Exports** - As used in IMPLAN are defined as outputs or products produced but not consumed or used in production of other outputs in the impact area. Includes both exports to other areas of the U.S. and international exports. (IC)

**Extended rotation** - A period of years that is longer than the time necessary to grow timber crop to a specified condition of maturity. (3)

**Extensive forest management** - A low investment level of management on regulated timberlands that requires initial harvest, regeneration, and final harvest. Some precommercial thinning may be done to prevent stagnation and disease buildup.

## F

**Facility Condition Class inventory** - A Recreation Information Management (RIM) system for classifying the existing condition of recreation facilities.

**Fault** - A ground surface fracture or fracture zone along which there has been a displacement of one side with respect to the other. (6)

**Fault scarp** - An abrupt change in surface elevation resulting from earthquake activity. Fault scarps may vary from as little as a few inches to two or three thousand feet.

**Federal Sustained Yield Unit (FSYU)** - A Federal timber management unit established under the authority of the Sustained Yield Forest Management Act of 1944.

**Fee Site** - A developed recreation site in which the visitor is charged a user fee for overnight camping. The amount of the fee will vary from site to site depending on the facilities and services provided.

**Feral** - Non-native species, or their progeny, which were once domesticated but have since escaped from captivity and are now living free. (6)

**Final cut** - See *Final Removal Harvest*.

**Final Environmental Impact Statement (FEIS)** - The final version of the statement of environmental effects required for major federal actions under section 102 of the National Environmental Policy Act. It is a revision of the draft environmental impact statement to include public and agency responses to the draft. (6)

**Final removal harvest** - The removal of the last seed bearers or shelter trees after regeneration is established under a shelterwood system. (6)

**Fire management** - All activities required for protection of resources from fire and for the use of fire to meet land management goals and objectives. (6)

**Fire Intensity Level (FIL)** - An expression of the amount of energy released as fuel is consumed in a fire.

**Fire suppression** - Action to limit the spread of and/or prevent damage by wildfire.

**Fisheries habitats** - Streams, lakes, and reservoirs that support fish populations.

**Flood plain** - The lowland and relatively flat area adjoining inland waters, including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year. (2)

**Forage** - All browse and nonwoody plants that are available to livestock or game animals and used for grazing or harvested for feeding. (6)

**Forb** - Any herb other than grass. (7)

**Foreground** - See *Distance Zone*.

**Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA)** - An Act of Congress requiring the preparation of a program for the management of the National Forests' renewable resources, and the

preparation of land and resource management plans for units of the National Forest System. It also requires a continuing inventory of all National Forest System lands and renewable resources. (6)

**Forest land** - Land at least 10 percent occupied by forest trees or formerly having had such tree cover and not currently developed for nonforest use. Lands developed for nonforest use include areas for crops, improved pasture, residential, or administrative areas, improved roads of any width, and adjoining road clearings and powerline clearings of any width. (1) (10)

**Forest Program** - A forest program is the summary or aggregation of project or activity information that makes up an integrated (multifunctional) course of action for a given level of funding on a national forest that is consistent with the Forest plan.

**Forest Service Handbook (FSH)** - For Forest Service use, directives that provide detailed instructions on how to proceed with a specialized phase of a program or activity. (10)

**Forest Service Manual (FSM)** - A system of manuals which provides direction for Forest Service activities.

**Forest succession** - The orderly process of change in a forest as one plant community or stand condition is replaced by another, evolving towards the climax type of vegetation. (16)

**Forest system roads** - Roads that are part of the Forest development transportation system, which includes all existing and planned roads as well as other special and terminal facilities designated as Forest development transportation facilities. (See *Arterial Roads, Collector Roads, and Local Roads*)

**Forest type** - A classification of forest land based upon the tree species presently forming a plurality of basal area stocking in live trees.

**Formally dedicated area** - An area of the Forest set aside for a specific use by virtue of a formal ceremony or congressional designation.

**FORPLAN** - A linear programming system used for developing and analyzing forest planning activities. (10)

**Free-to-grow** - A term used by silviculturists to indicate that trees are free of growth restraints, the most common of which is competing, over-topping vegetation.

**Fuel break** - A zone in which fuel quantity has been reduced or altered to provide a position for suppression forces to make a stand against wildfire. Fuel breaks are designated or constructed before the outbreak of a fire. Fuel breaks may consist of one or a combination of the following natural barriers, constructed fuel breaks, constructed barriers. (6)

**Fuel management** - The practice of planning and executing the treatment or control of living or dead vegetative material in accordance with fire management direction. (10)

**Fuel treatment** - The rearrangement or disposal of natural or activity fuels (generated by management activity, such as slash left from logging) to reduce fire hazard. Fuels are defined as both living and dead vegetative materials consumable by fire.

**Fuels** - Combustible wildland vegetative materials. While usually applied to above ground living and dead surface vegetation, this definition also includes roots and organic soils such as peat. (10)

**Fuelwood** - Wood which is primarily used by residential homeowners for heating purposes.

**Full cable suspension** - A cable yarding system capable of lifting and transporting logs above the ground and vegetation to a landing, resulting in minimum disturbance to the environment. Not all cable yarding systems have this capability. (16)

**Full-service management** - Management of developed recreation sites to furnish the full range of amenities and maintenance for the public enjoyment. Management objectives are based on site capacity, site protection needs, seasonal demands for public use, and desired levels of service to enhance visitor's experience and convenience and provide optimum maintenance.

**Furbearing species** - See *Game Species*.

## G

**Game species** - Any species of wildlife or fish for which seasons and bag limits have been prescribed and which are normally harvested by hunters, trappers, and fishermen under state or federal laws, codes, and regulations. (6)

**Genetic seedlings** - Tree seedlings from a genetically superior seed source. The seeds are collected from trees displaying exceptional form and raised in nurseries before outplanting. The seedlings usually have faster growth rates than naturally regenerated seedlings.

**Genetic tree improvement** - A general term including all practices designed to produce genetically better trees, such as forest tree breeding, selection and protection of superior seed trees. (3)

**Genetic Integrity** - Refers to a normal, healthy genetic pool (foundation) within a biological population to provide for long-term maintenance and survival of the species. Of specific concern in management direction is the prevention of loss of genetic variance (heterozygosity) and the avoidance of inbreeding depression, an important part of a given population's genetic integrity within the gene pool. (2)

**Geomorphology** - The science that deals with land and submarine relief features of the Earth's surface and seeks a genetic interpretation of them, using the principles of physiography in its descriptive aspects and dynamic and structural geology in its explanatory phases. (6)

**Geothermal** - Of or pertaining to the internal heat of the earth. (4)

**Gigawatt hour (GWh)** - A unit of energy equal to 1 billion watt hours.

**Goal** - A concise statement that describes a desired condition to be achieved sometime in the future. It is normally expressed in broad, general terms and is timeless in that it has no specific date by which it is to be completed. Goal statements form the principal basis from which objectives are developed. (2) (1)

**Goods** -

1. *Nonmarket good*. An output that is not normally exchanged for money in a market. Usually no market has evolved because ownership of the good is not clear, exclusive use is not possible under current laws, or it is not possible to consistently define good. (10)

2. *Public good*. An output for which it is impractical to impose a charge, either because it must be supplied to all if it is supplied to one or because the costs of collection and control exceed likely revenue. (10)

**Goods and services** - The various outputs, including on-site uses, produced from forest and rangeland resources. (2,1)

**Grass/forb** - An early forest successional stage where grasses and forbs are the dominant vegetation.

**Grays Harbor Federal Sustained Yield Unit** - Includes all National Forest land managed by the Quinault Ranger District. At present, 50 percent of the timber harvested from the District must receive primary manufacturing within Grays Harbor County.

**Group selection cutting** - See *Uneven-Aged Silvicultural Systems*.

**Growing season** - That part of the year when temperature and moisture are favorable for vegetation growth.

**Guideline** - An indication or outline of policy or conduct; i.e., any issuance that assists in determining the course of direction to be taken in any planned action to accomplish a specific objective. (2)

## H

**Habitat** - The place where a plant or animal naturally or normally lives or grows. (2)

**Habitat capability** - The estimated ability of an area, given existing or predicted habitat conditions, to support a wildlife, fish or plant population. It is measured in terms of potential population numbers.

**Habitat Capability index (HCI)** - A numerical expression of habitat capability measured in terms of potential population numbers.

**Habitat diversity** - The distribution and abundance of different plant and animal communities and species within a specific area.

**Habitat Quality Index (HQI)** - A numerical estimate of habitat quality expressed as a percentage of optimum.

**Hardwood** - A broad-leaved flowering tree.

**Harvest cutting method** - A combination of interrelated actions whereby forests are tended, harvested, and replaced. The combination of management practices used to manipulate the vegetation results in forests of distinctive form and character. Harvest cutting methods are classified as even-aged and uneven-aged.

**Harvest dispersion (factor)** - The dispersion of cutting units over the land base in order to meet clearcut size limitations, or other resource constraints. An example of a harvest dispersion constraint is: no more than 25 percent of an analysis area may be harvested in one decade.

**Headwaters** - The upper tributaries of a river. (4)

**Herbaceous** - An adjective describing seed-producing plants that do not develop persistent woody tissue, but die down to ground level at the end of the growing season.

**Herbicide** - An agent used to destroy or inhibit plant growth. (20)

**Hiding cover** - Vegetation that will hide 90 percent of an adult deer or elk from the view of a human at a distance of 200 feet or less. The distance at which the animal is essentially hidden is called a "sight distance."

**High-lead logging** - A system of cable logging wherein the main lead block is placed on a spar tree, generally 100 to 125 feet above the ground, giving a lifting effect to the incoming logs.

**High-site timbered lands** - A relative measure of resource productivity.

**Hog fuel** - Waste wood shredded into bits to be utilized as fuel. (3--Definition modified)

**Human Resource Programs** - Programs providing human and natural resource benefits through work, training, and education for the unemployed, the underemployed, the elderly, the young and others with special needs.

**Hydrology** - The scientific study of the properties distribution and effects of water in the atmosphere, on the earth's surface, and in soil and rocks.

**Hydropower** - Hydroelectric power; of or relating to production of electricity by waterpower. (20)

## I

**ID Team** - See *Interdisciplinary Team*.

**Impacts** - See *Effects*.

**IMPLAN** - A computer-based system used by the Forest Service for constructing nonsurvey input/output models to measure economic input. The system includes a data base for all countries in the U.S. and a set of computer programs to retrieve data and perform the computational tasks for input/output analysis. (10)

**Imports** - Used in IMPLAN and defined as purchases of products for use in production of other products and for final consumption from outside the impact area. Includes both imports from other areas of the U.S. and international imports. Competitive imports are the same as local domestic products which are not produced in quantities sufficient to meet local demands or which obtain a share of the local market formerly supplied by local producers. Noncompetitive imports are products not produced locally. (10)

**Improved genetic stock** - Group of plants (trees) that have been improved genetically. (4)

**Income** - Employee compensation, profits, rents, and other payments to households. (10)

**Indicator species** - See *Management Indicator Species*.

**Indirect outputs** - Outputs caused by an action, but which are later in time or farther removed in distance, although still reasonably foreseeable. (See *Effects*.)

**Individual (single) tree selection** - See *Uneven-Aged Silvicultural Systems*.

**Induced outputs** - Outputs in the private sector induced by the direct outputs produced on the Forest. (6)

**Influence zone** - See *Zone of influence*.

**Input/output analysis** - A quantitative study of the interdependence of a group of activities, based on the relationship between inputs and outputs of the activities. The basic tool of analysis is an input-output model for a given period that shows simultaneously for each economic sector the value of inputs and outputs, as well as the value of transactions within each economic sector. It has especially been applied to estimate the effects of changes in Forest output levels on local economic activity. (3)

**Insecticide** - A pesticide for control of insects. (16)

**Instream flows** - A prescribed level (or levels) of streamflow, usually expressed as a stipulation in a permit authorizing a dam or water diversion, for the purpose of meeting National Forest System management objectives.

**Integrated pest management (IPM)** - A process for selecting strategies to regulate forest pests in which all aspects of a pest-host system are studied and weighed. The information considered in selecting appropriate strategies includes the impact of the unregulated population on various resource values, alternative regulation tactics and strategies, and benefit/cost estimates of those alternative strategies. Regulatory strategies are based on sound silvicultural practices and ecology of the pest-host system, and consist of a combination of tactics such as timber stand improvement plus selective use of pesticides. A basic principle in the choice of strategy is that it be ecologically compatible or acceptable. (2) (1)

**Integrated Resource Analysis Areas (IRAA)** - An area of the Forest, generally defined by watershed or basin boundaries, which is used for planning, analysis, and scheduling of project activities.

**Integrated resource management** - A management strategy which emphasizes no resource element to the exclusion or violation of the minimum legal standards of others. (FSM 1905)

**Intensive management (Intensive forest management)** - A high investment level of timber management that includes use of precommercial thinnings, commercial thinnings, genetically improved stock, and control of competing vegetation. (2)

**Interdisciplinary Team (ID)** - A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the problem. (6)

**Intermediate cutting** - Any removal of trees from a stand between the time of its formation and the regeneration cut. Most commonly applied intermediate cuttings are release, thinning, improvement, and salvage. (6)

**Intermingled ownerships** - Lands that are owned by private interests or other government agencies and located within the National Forest boundaries or surrounded by National Forest land.

**Intermittent stream** - A stream with running water in most months, but without water in the summer season during most years.

**Intertile** - A link between two points, objects, or concepts. (5)

**Inventory data and information collection** - The process of obtaining, storing, and using current inventory data appropriate for planning and managing the Forest. (6)

**Irretrievable** - Applies to losses of production, harvest, or commitment of renewable natural resources. For example, some or all of the timber production from an area is irretrievably lost during the time an area is used as a winter sports site. If the use is changed, timber production can be resumed. The production lost is irretrievable, but the action is not irreversible. (10)

**Irreversible** - Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors that are renewable only over long time spans, such as soil productivity. Irreversible also includes loss of future options. (10)

**Issue** - A point, matter, or question of public discussion or interest to be addressed or decided through the planning process. (See also *Public Issue*.) (2)

## L

**Land allocation** - The assignment of management emphases to particular land areas with the purpose of achieving goals and objectives of a specific alternative.

**Land and Water Conservation Fund (L&WCF)** - Funds collected from sales of surplus Government real property, motorboat fuels taxes, recreation use fees, etc. which are available to purchase and develop certain qualifying lands for recreational purposes.

**Land class** - The topographic relief of a unit of land. Land classes are separated by degrees of slope, and is a classification system used in the timber inventory process. The three land classes used in the Olympic National Forest Plan are defined by the following slope ranges: 0 to 40 percent; 40 to 60 percent; and greater than 60 percent.

**Land exchange** - The acquisition of non-Federal land and/or interests in exchange for National Forest System land or interests.

**Landform** - An area of that is defined by its particular combination of bedrock and soils, erosion processes and climatic influences.

**Landing** - Any place where round timber is handled and assembled for further transport. (3)

**Land management** - The intentional process of planning, organizing, programming, coordinating, directing, and controlling land use actions. (6)

**Landownership pattern** - The National Forest System resource land base, in relation to other land ownerships within given boundaries. (2)

**Landscape management** - The art and science of planning the use of Forest lands in ways that visual resource values are protected or enhanced. The planning and design of the visual aspects related to multiple-use land management.

**Lands not appropriate for timber production** - Includes lands that: 1) are proposed for resource uses that preclude timber production, such as Wilderness; 2) have other management objectives that limit timber production to the point where management requirements set forth in CFR 219.27 cannot be met: or, 3) are not cost efficient over the planning horizon in meeting forest objectives including timber production. (1)

**Lands not suited (unsuitable) for timber production** - Includes lands that: 1) are not forest land as defined in CFR 219.3; 2) are likely, given current technology, to suffer irreversible resource damage to soils productivity, or watershed conditions; 3) cannot be adequately restocked as provided in 36 CFR 219.27(c)(3); or, 4) have been withdrawn from timber production by an Act of Congress, the Secretary of Agriculture, or the Chief of the Forest Service. In addition, Forest lands in alternatives that are otherwise suited (items 1,2,3 and 4), but are located in Management Areas with prescriptions that preclude management timber production, such as Wilderness or Research Natural Areas.

**Lands suitable for timber production** - Includes all lands not classified as either Not Suited or Not Appropriate for Timber Production.

**Landtype** - A portion of the Forest mapped in the National Forest Soil Resource Inventory that has a defined arrangement of specific landforms that reacts to management activities in generally predictable ways. Landtypes range from 60 to 600 acres in size.

**Landtype association** - A group of landtypes that make up a large portion of the Forest. The landtypes are sufficiently homogeneous to be considered as a whole for modeling the future outputs and effects of planned management activities. Landtype Associations do not usually follow watershed boundaries and are defined on the basis of general similarities in geology, climate, landform and vegetation.

**Land use allocation** - The commitment of a given area of land or a resource to one or more specific uses--for example, to campgrounds or wilderness. (6)

**Large organic debris (LOD) (Large woody debris)** - Large downed trees, primarily conifers, that accumulate on land or in streams or other water bodies, This material is important for wildlife and fishery habitat and stream channel stability.

**Large saw timber** - A stand condition in which the average tree diameter exceeds 21 inches DBH.

**Leasable minerals** - Coal, gas, oil, phosphate, sodium, potassium, oil shale, sulphur, geothermal steam. Also includes other minerals on acquired National Forest lands. (6)

**Least-cost analysis** - Determination of the least cost means of attaining specified results. (10)

**Level IV Law Enforcement Officer** - A Forest Service employee who has graduated from the Federal Law Enforcement Academy and holds a law enforcement commission signed by the Regional Forester. District Level IV officers generally perform other duties as well as law enforcement.

**Lifestyle** - The characteristic way people live, indicated by consumption patterns, work, leisure, and other activities. (10)

**Limit of Acceptable Change (LAC)** - The amount of change to be allowed while maintaining the desired Wilderness conditions.

**Linear programming** - A mathematical method used to determine the cost-effective allocation of limited resources between competing demands when both the objective (e.g., profit or cost) and the restrictions on its attainment are expressible as a system of linear equalities or inequalities. (6)

**Locatable minerals** - Those hardrock minerals which can be obtained by filing a claim on Public Domain or National Forest System lands reserved from the Public Domain. In general, the locatable minerals are those hardrock minerals which are mined and processed for the recovery of metals, but may also include certain nonmetallic minerals and uncommon varieties of mineral materials. (6)

**Logging residues** - See *Slash*.

**Long-term sustained yield capacity (LTSYC)** - The highest uniform wood yield from lands being managed for timber production that may be sustained under a specified management intensity, consistent with multiple-use objectives. (1)

## M

**Management Area** - An area with similar management objectives and a common management prescription. (1) (10)

**Management concern** - An issue, problem, or condition which influences the range of management practices identified by the Forest Service in the planning process. (1)

**Management direction** - A statement of multiple use and other goals and objectives, and the associated management prescriptions, and standards and guidelines for attainment. (1)

**Management emphasis** - That portion of a management scheme which receives the most stress or is of the greatest significance or importance. It may be the resources being produced, or it may be the way in which they are produced.

**Management indicator species** - A species selected because its welfare is presumed to be an indicator of the welfare of other species using the same habitat. A species whose condition can be used to assess the impacts of management actions on a particular area. (8)

**Management intensity** - The management practices or combination of management practices and associated costs to obtain different levels of goods and services (1). In FORPLAN management prescriptions, a set of activities designed to accomplish a particular management emphasis (see also *Management Prescription*).

**Management practice** - A specific activity, measure, course of action, or treatment. (1)

**Management prescription** - The management practices and intensity selected and scheduled for application on a specific area to attain multiple use and other goals and objectives (1). In FORPLAN, the combination of a management emphasis and associated management intensities with a variety of timing choices for implementation. (2)

**Management Requirement (MR)** - Standards for resource protection, vegetation manipulation, silvicultural practices, even-aged management, riparian areas, wildlife population viability, soil and water protection and diversity, to be met in accomplishing National Forest System goals and objectives. (1)

**Management Strategy** - See *Management Prescription*.

**Marginal timber component** - Timber on which the income just equals or could just equal the costs of production under a given farm of management. (3)

**Market** - The processes of exchanging a good or service for money or other goods or services according to a customary procedure. A market may occur in a specific place or throughout an area by individual transactions. (10)

**Market area** - The area from which a market draws or to which it distributes its goods or services and for which the same general price structure and price influences prevail. (10)

**Market value** - The unit price of an output normally exchanged in a market after at least one stage of production. Market value is expressed in terms of prices as evidenced by market transactions. (10)

**Mass movement (mass wasting)** - A general term for any of the variety of processes by which large masses of earth material are moved downslope by gravitational forces - either slowly or quickly. (6)

**Mature timber** - Trees that have attained full development, particularly height, and are in full seed production. When used for seral stage, it refers to trees which are 9 inches DBH to 20.9 inches DBH. When used for wildlife habitat, it refers to stands of conifer trees with a multi-layered canopy of at least two layers. The overstory trees will be dominated by conifers, 21 inches DBH or larger. (3)

**Mature saw timber** - Trees or stands of trees which generally have reached culmination mean annual increment. (10)

**Maximum modification (MM)** - See *Visual Quality Objective*.

**Mean annual increment (MAI) (of growth)** - The total volume of a tree or stand of trees up to a given age divided by that age. (2)

**Memorandum of Understanding (MOU)** - A written plan between the Forest Service and non-Federal parties for carrying out their separate activities in a coordinated and mutually beneficial manner. Each party directs its own activities and uses its own resources. A Memorandum of Understanding is not a fund obligating document. (10)

**Mesotrophic** - Habitats, particularly soil and water, of moderate nutrient capacity. (3)

**Middleground** - See *Distance Zone*.

**Mineral entry** - The filing of a mining claim upon public domain or related land to obtain the right to any minerals it may contain. (6)

**Mineral entry withdrawal** - The exclusion of mining locations and mineral development work on areas required for administrative sites by the Forest Service and other areas highly valued by the public. (6)

**Mineral materials** - Deposits such as sand, stone, gravel, and clay. (6)

**Mineral soil** - Weathered rock materials usually containing less than 20 percent organic matter. (6)

**Minimum level management** - FORPLAN term designating lands that will not be actively managed for timber or forage production. Often, these are lands that have high costs and low benefits associated with their management.

**Minimum streamflows** - A specified level of streamflow that must be maintained to benefit biological, physical, or other purposes.

**Mining claim** - A portion of public land which a claimant takes and holds in accordance with mining laws. (6)

**Mitigation** - Mitigation includes: (a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or elimination the impact over time by preservation and maintenance operations during the life of the action; and, (e) compensating for the impact by replacing or providing substitute resources or environments. (40 CFR Part 1508.20)

**Mitigation measures** - Actions to avoid, minimize, reduce, eliminate, or rectify adverse impacts of management practices.

**Model** - A representation of reality used to describe, analyze, or understand a particular concept. A “model” may be a relatively simple qualitative description of a system or organization, or a highly abstract set of mathematical equations. (6)

**Modification (M)** - See *Visual Quality Objective*.

**Monitoring and evaluation** - The periodic evaluation of Forest Plan management practices on a sample basis to determine how well objectives have been met.

**Monoculture** - The raising of a crop of trees consisting of only one species; such crops are usually even-aged. (16)

**Mortality** - In wildlife management, the loss in a population from any cause, including hunter kill, poaching, predation, accident, and disease. In forestry, trees in a stand that die of natural causes. (8)

**Mountain pine beetle** - A tiny black insect, ranging in size from 1/8 to 3/4 inch, that bores its way into a tree’s cambium and cuts off its supply of nutrients, thus killing the tree.

**Multiple use** - The management of all the various renewable surface resources of the National Forest System so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some lands will be used for less than all of the resources, and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land and with consideration being given to the relative values of the various resources; and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output. (1)

**Multiplier** - A ratio of a measure of total change in income or employment to the direct income or employment change. The measure to total change may be direct plus indirect change (Type I Multipliers); or direct, indirect, and induced change (Type II Multipliers); or direct, indirect, and interactive increased induced demands based on population increase (Type III Multipliers). (10)

**Municipal watershed** - A watershed which provides water for human consumption and Forest Service management could have a significant effect on the quality of water at the intake point. Water is utilized by a community or any other water system that regularly serves: (1) at least 25 people at least 60 days in a year, or (2) at least 15 service connections. In addition to cities, campgrounds, residential developments, and restaurants may be included under regulations and standards applicable to municipal watersheds. (10)

## N

**National Direction** - Statements of missions, goals, and objectives that guide Forest Service planning. (FSM 1905)

**National Environmental Policy Act (NEPA) of 1969** - An Act, “to declare a National policy which will encourage productive and enjoyable harmony between humankind and the environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.” (The Principal Laws Relating to Forest Service Activities, Agriculture Handbook No. 453, USDA, Forest Service, 359 pp.)

**National Forest Land and Resource Management Plan** - A Plan which “...shall provide for multiple use and sustained yield of goods and services from the National Forest System in a way that maximizes long-term net public benefits in an environmentally sound manner.” (1)

**National Forest Management Act (NFMA)** - A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring the preparation of Regional Guides and Forest Plans and the preparation of regulations to guide that development.

**National Forest Systems (NFS)** - All National Forest lands reserved or withdrawn from the public domain of the United States, all National Forest lands acquired through purchase, exchange, donation, or other means, the National Grasslands and land utilization projects administered under Title III of the Bankhead-Jones Farm Tenant Act (50 Stat 525, 7 U.S.C. 1010-1012), and other lands, waters, or interests therein which are administered by the Forest Service or are designated for administration through the Forest Service as a part of the system. (16 U.S.C. 1608)

**National Recreation Trails (NRT)** - Trails designated by the Secretary of the Interior or the Secretary of Agriculture as part of the National system of trails authorized by the National Trails System Act. National Recreation Trails provide a variety of outdoor recreation uses. (6)

**National Recreation Strategy** - A conceptual framework aimed at finding creative and imaginative ways to take advantage of outdoor recreation opportunities by working with people to strengthen and round out the multiple-use management of the National Forests.

**National Register of Historic Places** - A register of cultural resources of national, state, or local significance maintained by the USDI, National Park Service. (10)

**National Wilderness Preservation System** - All lands covered by the Wilderness Act and subsequent Wilderness designations, regardless of the governmental department having jurisdiction.

**Natural barrier** - A natural feature that restricts livestock or wildlife movements, such as a dense stand of trees or a cliff.

**Natural regeneration** - Reforestation of a site by natural seeding from the surrounding trees. Natural regeneration may or may not be preceded by site preparation.

**Net cash flow** - The difference between the annual receipts of an alternative and costs required to implement that alternative.

**Net public benefits** - An expression used to signify the overall long-term value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs), whether they can be quantitatively valued or not. Net public benefits are measured by both quantitative and qualitative criteria rather than a single measure or index. The maximization of net public benefits to be derived from management of units of the National Forest System is consistent with the principles of multiple use and sustained yield. (1)

**Net receipts** - Receipts minus costs.

**Net returns to the Treasury, net cash flow** - The difference between the total dollar receipts projected for an alternative and the total budget required to implement the alternative.

**Nitrogen-fixing (Nitrogen fixation)** - Conversion of free nitrogen by plants such as red alder into combined forms useful in nutrient cycles and other functions in the biosphere.

**No Action Alternative (Alt. A)** - This alternative is the “No Action” alternative required by the National Environmental Policy Act. It analyzes the effects of continuing management under direction established by the Olympic National Forest’s Timber Management Plans, using updated timber resource inventories and yield tables. Often used interchangeably with “Current Direction” Alternative throughout the EIS.

**No Change Alternative (Alt. NC)** - This alternative would implement the Olympic National Forest Timber Management Plans, using the yield tables and timber resource inventories developed for the Plans. This alternative does not include all management requirements and would not meet the intent of the National Forest Management Act of 1976.

**Nominal value** - A monetary value relative to time that does not account for the effects of inflation.

**Nonchargeable volume** - All volume not included in the growth and yield projections for the selected management prescriptions used to arrive at the allowable sale quantity. (FSH 2409.13)

**Noncommodity outputs** - Resource outputs that are not normally bought and sold, or cannot be bought and sold, such as air quality or scenic beauty.

**Nonconsumptive use** - That use of a resource that does not reduce the supply. For example, nonconsumptive use of water includes hydroelectric power generation, boating, and swimming. (2)

**Nondeclining flow (NDF)** - Where the quantity of timber planned for sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade, and this planned sale and harvest for any decade is not greater than the long-term sustained yield capacity. (1)

**Nonforest land** - Lands that never have had or that are incapable of having 10 percent or more of the area occupied by forest trees; or lands previously having such cover and currently developed for nonforest use. (6)

**Nongame species** - Animal species which are not hunted, fished, or trapped.

**Nonmarket value** - The unit price of a nonmarket output normally not exchanged in a market at any stage before consumption; it is thus necessary to impute nonmarket value from other economic information. (10)

**Nonmarket valued outputs** - Assessed value of a goods or service which is not traded in the market place and has no market value. Because it is not bought and sold, some measure other than price must be used in establishing the value. (6)

**Nonpoint source pollution** - Pollution whose source is general rather than specific in location. It is widely used in reference to agricultural and related pollutants. For example, production of sediments by logging operations, agricultural pesticide applications, or automobile exhaust pollution. (6)

**Nonpriced outputs** - Nonpriced outputs are those for which there is no available market transaction evidence and no reasonable basis for estimating a dollar value. Subjective nondollar values are given to nonpriced outputs.

**No surface occupancy** -A clause used in mineral leases to prevent activities in sensitive areas. Sometimes results in closure of an area and sometimes has little impact if directional drilling can tap resources underlying restricted area.

**Noxious weeds** - Undesirable plant species that are unwholesome to the range or to animals. (6)

## O

**Objective** - A concise, time-specific statement of measurable planned results that respond to pre-established goals. 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. (1)

**Off-road vehicle (ORV)** - Any motorized vehicle designed or capable of cross-county travel or travel on trails or low-standard roads (e.g. motorbikes, ATVs, 4-wheel drive vehicles, snowmobiles). (2)

**Old-growth deficit** - A forest without the excess volume of mature/overmature old-growth trees that could be used to offset reductions in programmed harvest volume resulting from allocation changes.

**Old-growth habitat** - Habitat for certain wildlife that is characterized by overmature coniferous forest stands with large snags and decaying logs.

**Old-growth stand (old-growth) (OG)** - Any stand of trees 10 acres or greater generally containing the following characteristics: 1) contain mature and overmature trees in the overstory and are well into the mature growth stage; 2) will usually contain a multilayered canopy and trees of several age classes; 3) standing dead trees and down material are present; and 4) evidences of man's activities may be present, but do not significantly alter the other characteristics and would be a subordinate factor in a description of such a stand. See the Regional Guide. (2)

**Oligotrophic** - Lakes characterized by a low accumulation of dissolved nutrient salts, supporting only sparse plant and animal life, and having a high oxygen content, owing to the low organic content. (4)

**Open to entry** - With respect to minerals management, lands available for mineral exploration and development under the mining laws.

**Operational costs** - Those costs associated with administering and maintaining National Forest facilities and resource programs.

**Operational Plan** - A document approved by the Forest Supervisor which specifies at the project level, implementation of the management direction established in the Forest Plan. (6)

**Opportunity** - A proposal that is considered in developing alternative activities, projects or programs where an option exists to invest profitably to improve or maintain a present condition.

**Opportunity cost** - The net value that is foregone when a given resource is employed in something other than its most efficient alternative use.

**Optimal cover** - Habitat for deer and elk which has tree overstory and understory, shrub and herbaceous layers; the overstory canopy generally exceeds 70% crown closure, and dominant trees generally exceed 21" DBH, which provide snow intercept, thermal cover, and maintenance forage.

**Output** - A good, service, or on-site use that is produced from forest and rangeland resources. See FSH 1309.11 for forest and rangeland outputs codes and units measure. Examples: X06-Softwood Sawtimber Production MBF; X80-Increased Water Yield - Acre Feet; W01-Primitive Recreation Use RVD's. (FSM 1905)

**Output, Market** - A good, service, or on-site use that can be purchased at a price. (FSM 1905)

**Output, Nonmarket** - A good, service, or on-site use not normally exchanged in a market. (FSM 1905)

**Overbid** - To bid more than the appraised value. (4)

**Overmature timber** - The stage at which a tree declines in vigor and soundness. For example, a stage past the period of rapid height growth. (2)

**Overstory** - That portion of the trees, in a Forest or stand with more than one crown canopy, that forms the uppermost canopy. (3)

**Overuse (overutilization)** - Utilizing an excessive amount of the current year's growth which, if continued, will result in overgrazing and range deterioration.

**Overwood removal** - A harvest method that removes the overstory of a two-story stand and leaves the smaller understory for further treatment (thinning or harvesting).

## P

**Partial cut** - Covers a variety of silvicultural practices where a portion of the stand is removed and a portion is left.

**Partial retention (PR)** - Sec *Visual Quality Objective*.

**Particulates** - Small particles suspended in the air and generally considered pollutants. (See *Total Suspended Particulates*.) (5)

**Perennial stream** - A stream that flows year round.

**Permittee** - Any person or business formally allowed to graze livestock on the land of another person or business (e.g., on state or federal land). (3)

**Personal use** - Normally used to describe the type of permit issued for removal of wood products (firewood, posts, poles, and Christmas trees) from National Forest land when the product is for home use and not to be resold for profit.

**Persons-at-one-time (PAOT)** - A recreation capacity measurement term indicating the number of people who can use a facility or area at one time. (2)

**Pests** - Any animal or plant that, during some portion of its life cycle, inhibits the establishment or growth of some other species of plant or animal favored by man.

**Pesticide** - A substance intended for controlling insects, rodents, weeds, and other forms of plant or animal life that are considered to be pests. (16)

**Phenology** - The science dealing with the influence of climate on the recurrence of such annual phenomena of animal and plant life as bird migrations, budding, etc... (4)

**Physiographic province** - A Region having a particular pattern of relief features or land forms that differs significantly from that of adjacent Regions. (6)

**Planned ignition** - A fire started deliberately, and controlled to accomplish a resource management objective.

**Planning area** - The area of the National Forest System covered by a Regional guide or forest plan. (1)

**Planning criteria** - Criteria prepared to guide the planning process. Criteria applied to collection and use of inventory data and information, analysis of the management situation, and the design, formulation, and evaluation of alternatives. (1)

**Planning horizon** - The overall time period considered in the planning process. It spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions which would influence the planning decisions. (1) In this FEIS and Forest Plan, the planning horizon is considered to be 15 decades.

**Planning period** - One decade. The time interval within the planning horizon that is used to show incremental changes in yields, costs, effects, and benefits. (1)

**Planning records** - The body of information documenting the decisions and activities which result from the process of developing a Forest Plan, revision, or significant amendment.

**Plan of Operations** - A document required from any person proposing to conduct mineral-related activities which utilize earth moving equipment and which will cause disturbance to surface resources or involve the cutting of trees. (36 CFR 228.4)

**Plant associations** - Abstract units of the potential vegetation which are characterized by the same over-story and understory dominants.

**Plant community** - A vegetative complex unique in its combination of plants; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site such as soils, temperature, elevation, solar radiation, slope, aspect, and rainfall: as used in this publication: plant associations where composition or structure provide significantly different wildlife habitat characteristics (e.g., herbaceous wetland, conifer/hardwood forest, high-temperate coniferous forest). (16)

**Pole/sapling** - A Forest successional stage in which trees between five and nine inches in diameter are the dominant vegetation. (See also *Size Class*.)

**Pole timber** - Trees of at least five inches in diameter at breast height, but smaller than the minimum utilization standard for sawtimber. (See also *Size Class*.)

**Policy** - A guiding principle upon which is based a specific decision or set of decisions. (FSM 1905)

**Potential yield** – (*This term is in reference to the 1979 Timber Resource Plan only.*) Optimum sustained yield of timber harvest volume attainable with intensive forestry on available commercial forest land (forest lands able to produce 20 cubic feet of timber per acre per year or more) while considering the interrelationship with other forest resources and uses. Intensive forestry includes planting only with genetic stock, precommercial thinning, commercial thinning and release. Programmable net salvage volume and volume from marginally economical lands are also included (in reference to 155.2 MMBF per year in the 1979 TM Plan).

**Practices** - Those management activities that are proposed or expected to occur.

**Precommercial thinning (POT)** - The practice of removing some of the trees less than marketable size from a stand so that the remaining trees will grow faster. (2)

**Prehistoric site** - An area which contains important evidence and remains of the life and activities of early societies which did not record their history.

**Preparatory cut** - The removal of trees near the end of a rotation, which permanently opens the canopy and enables the crowns of seed bearers to enlarge, to improve conditions for seed production and natural regeneration. Typically done in the shelterwood system. (3)

**Prescribed fire** - A wildland fire burning under specified conditions which will accomplish certain planned objectives. The fire may result from either planned or unplanned ignitions. Proposals for use of unplanned ignitions for this purpose must be approved by the Regional Forester. (2)

**Prescription** - A written direction for harvest activities and regeneration methods.

**Present net value (PNV)** - The difference between the discounted value (benefits) of all outputs to which monetary values or established market prices are assigned and the total discounted costs of managing the planning area. (1)

**Preservation (P)** - See *Visual Quality Objective*. (2)

**Presuppression** - Activities organized in advance of fire occurrence to ensure effective suppression action. (2)

**Price** - The unit value of an output expressed in dollars. (10)

**Price elasticity** - A measure of the sensitivity of the quantity of a good or service exchanged to changes in price. (10)

**Priced outputs** - Priced outputs are those that are or can be exchanged in the market place. The dollar values for these outputs fall into two categories: market or nonmarket (assigned values).

**Price-quantity relationship** - A schedule of prices that would prevail in a market for various quantities of the output exchanged. (10)

**Price trend analysis** - An analysis done to estimate how a particular FORPLAN solution would change if predicted price trends were increased or decreased.

**Primary cavity excavator** - Wildlife species that excavate cavities in snags (dead trees). (16)

**Primary manufacture** - The cutting of logs into rough green products (lumber, veneer, chips, shingles, or shakes) of various dimensions.

**Proclaimed land** - Lands reserved from the Public Domain for National Forest purposes by presidential proclamation.

**Program** - Sets of activities or projects with specific objectives, defined in terms of specific results and responsibilities for accomplishments. (10)

**Program Budget** - A plan that allocates annual funds, work force ceilings, and targets among agencies. (10)

**Program Budget Level** - A single, comprehensive integrated program responsive to the Chief's direction that specifies a level of production attainable from a given investment of dollars and other resources. Each budget level represents a complete, full, and independent package within the criteria and constraints identified. (10)

**Programmatic Memorandum of Agreement** - An agreement between the USDA Forest Service, Pacific Northwest Region, the Washington State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation on the management of two types of cultural resource sites found on the Forest: Depression-era administrative structures and prehistoric lithic scatters.

**Programmed harvest** - The amount of timber on the Forest that is scheduled for harvesting. The programmed harvest is based on current demand, funding, and multiple-use considerations.

**Project** - An organized effort to achieve an objective identified by location, timing, activities, outputs, effects, and time period and responsibilities for executions. (10)

**Project design** - The process of developing specific information necessary to describe the location, timing, activities, outputs, effects, accountability, and control of a project.

**Public Involvement** - A Forest Service process designed to broaden the information base upon which agency decisions are made by (1) informing the public about Forest Service activities, plan, and decisions, and (2) encouraging public understanding about and participation in the planning processes which lead to final decision making. (10)

**Public issue** - A subject or question of widespread public interest relating to management of the National Forest System. (1)

**Public participation** - Meetings, conferences, seminars, workshops, tours, written comments, responses to survey questionnaires, and similar activities designed and held to obtain comments from the public about Forest Service planning. (2)

**Public participation activities** - Meetings, conferences, seminars, workshops, tours, written comments, survey questionnaires, and similar activities designed or held to obtain comments from the general public and specific publics.

**Purchaser credit** - Credit earned by the purchaser of a National Forest timber sale by construction of contract-specified roads. Earned purchaser credit may be used by the purchaser as payment for National Forest timber removed. (2)

## R

**Range management** - The art and science of planning and directing range utilization to secure sustained maximum production of livestock, milk, and/or cut forage, consistent with other uses and conserving natural resources. (3)

**Raptors** - Predatory birds, such as falcons, hawks, eagles, and owls.

**Rate of return** - The financial yield per unit cost determined as the rate of interest at which total discounted benefits equal total discounted costs. (Internal rate of return is a similar measure appropriate to the benefits and costs that affect private firms or individuals.) (10)

**Real dollar value** - A monetary value that compensates for the effects of inflation. (1)

**Rearing habitat** - Aquatic environments that have chemical properties and physical and biological characteristics suitable for raising juvenile fish species.

**Receipts** - Those priced benefits for which money will actually be paid to the Forest Service: recreation, timber harvest, mineral leases and special use fees.

**Receipt shares** - The portion of receipts derived from Forest Service resource management that is distributed to State and county governments, such as the Forest Service 25-percent fund payments. (1)

**Record of Decision (ROD)** - A document separate from, but associated with, an Environmental Impact Statement which states the decision, identifies all alternatives, specifies which alternatives were environmentally preferable, and states whether all practicable means to avoid environmental harm from the alternative have been adopted, and if not, why not. (40 CFR 1505.2)

**Recreation capacity** - The number of people that can take advantage of the recreation opportunity at any one time without substantially diminishing the quality of the recreation experience or the biophysical resources. (2)

**Recreation information Management (RIM)** - A computer-oriented system for the organization and management of information concerning recreation use, occupancy, and management of National Forest resources.

**Recreation opportunity** - The availability of choice for a user to participate in a preferred activity within a preferred setting, in order to realize desired, satisfying, recreational experiences.

**Recreation 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 have been arranged along a continuum or spectrum divided into seven classes. Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roaded Modified, Roaded Natural, Rural, Urban.

**1 - Primitive** - Area is characterized by an essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls Motorized use within the area is not permitted.

**2 - Semi-Primitive Non-Motorized** - Area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that subtle, minimum on-site controls and restrictions may be present. Motorized recreation use is not permitted, but local roads used for other resource management activities may be present on a limited basis. Use of such roads is restricted to minimize impacts on recreational experience opportunities.

**3 - Semi-Primitive Motorized** - Area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions, use of local primitive or collector roads with predominantly natural surfaces, and trails suitable for motor bikes are permitted.

**4 - Roaded Natural** - Area is characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.

**5 - Roaded Modified** - A subclass of the Roaded Natural ROS class. Involves areas that are characterized by predominantly natural-appearing environments with high evidence of the sights and sounds of humans. Such evidence may not harmonize with the natural environment interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident and may not harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.

**6 - Rural** - Area is characterized by a natural environment that has been substantially modified by development of structures, vegetative manipulation, or pastoral agricultural development. Resource

modification and utilization practices may be used to enhance specific recreation activities and maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate user densities are present in areas adjacent to developed sites. Facilities for intensified motorized use and parking are available.

**7 - Urban** - Area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are often used to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans are predominant on site. Large numbers of users can be expected both on a site and in nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.

**Recreation Visitor Day (RVD)** - A measure of recreation use, in which one RVD equals twelve visitor hours, which may be aggregated continuously, intermittently, or simultaneously by one or more persons. (2)

**Recreational river** - See *Wild and Scenic River*.

**Reduced service management** - Management of developed recreation facilities below optimum maintenance standards.

**Reforestation** - The natural or artificial restocking of an area with forest trees. (2)

**Regeneration** - The renewal of a tree crop, whether by natural or artificial means. Also, the young crop itself, which is commonly referred to as reproduction. (2)

**Region** - An area covered by a Regional guide. See FSM 1221.3 for organizational definitions. (10)

**Regional Forester** - The Forest Service official responsible for administering a single Region.

**Regional Guide** - The guide developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended. It guides all natural resource management activities, and establishes management standards and guidelines for the National Forest System lands within a given Region. It also disaggregates the assigned Regional RPA objectives to the Forests within that Region.

**Regulations** - Generally refers to the Code of Federal Regulations, Title 36, Chapter II, which covers management of the Forest Service. (2)

**Rehabilitation** - Action taken to restore site productivity, water quality, or other resource values over a period of time.

**Release** - Freeing trees from competition for light, water, and nutrients by removing or reducing the vegetation growth that is overtopping or closely surrounding them.

**Removal cut (final cut)** - The removal of the last seed bearers or shelter trees after regeneration is established under a shelterwood method. (6)

**Renewable resources** - Resources that are possible to use indefinitely, when the use rate does not exceed the ability to renew the supply.

**Renewable Resources Assessment** - An appraisal of the Nation's renewable resources that recognizes their vital importance and the necessity for long-term planning and associated program development. The Assessment meets the requirements of Section 3 of the Resources Planning Act and includes analyses of present and anticipated uses, demands, and supplies of the renewable resources; a description of Forest Service programs and responsibilities; and a discussion of policy considerations, laws, and regulations.

**Research Natural Area (RNA)** - An area set aside by a public or private agency specifically to preserve a representative sample of an ecological community, primarily for scientific and educational purposes. In USDA Forest Service usage, Research Natural Areas are areas designated to ensure representative samples of as many of the major naturally-occurring plant communities as possible. (6)

**Reserved lands** - Lands which have been removed from the acreage base used to calculate timber yields. These lands often have a preservation or protection status. Wildernesses, Research Natural Areas, and National Recreation Areas are examples of reserved lands. These areas are designated as reserved by the authority of the Chief of the Forest Service, or a higher official (see *Proclaimed Land*). (2)

**Resident fish** - Fish that do not require extended migrations to complete their life cycles. (16)

**Residue** - The vegetative material left on the ground after timber cutting and/or accumulating there as a result of storm, fire, or other damage. It includes unused logs, uprooted stumps, broken or uprooted stems, branches, twigs, leaves, bark, and chips.

**Residual stand** - The trees remaining standing after some activity such as selection cutting. (2)

**Resource** - Anything which is beneficial or useful - be it animal, vegetable, mineral, a location, a labor force, a view, an experience, etc. Resources, in the context of land use planning, thus vary from such commodities as timber and minerals to such amenities as scenery, scenic view points, or recreation opportunities. (6)

**Resource allocation** - The action of apportioning the supply of a resource to specific uses or to particular persons or organizations. (6)

**Resource Allocation Model (RAM)** - A mathematical model using linear programming which will allocate land to different management prescriptions and schedule implementation of those prescriptions simultaneously. The purpose of the model is to find a schedule and allocation that meets the goals of the Forest and optimizes some objective function, such as "minimize costs."

**Resource Management Plan** - A Plan developed prior to the Forest Plan that outlined the activities and projects for a particular resource element independently of considerations for other resources. Such Plans will be superseded by the Forest Plan.

**Resource Planning Act (RPA)** - The Forest and Rangeland Renewable Resources Planning Act of 1974. Also refers to the National Assessment and Recommended Program developed to fulfill the requirements of the Act. (2)

**Responsible line officer** - The Forest Service employee who has the authority to select and/or carry out a specific planning action. (1)

**Retention (R)** - See *Visual Quality Objective*.

**Returns to counties** - The portion of receipts derived from Forest Service resource management that is distributed to State and county governments such as the Forest Service 25 percent fund payments.

**Right-of-way (R/W)** - An accurately located strip of land with defined width, point of beginning, and point of ending; the area within which the user has authority to conduct operations approved or granted by the landowner in an authorizing document, such as a permit, easement, lease, license, or Memorandum of Understanding. (6)

**Riparian** - Pertaining to areas of land directly influenced by water. Riparian areas usually have visible vegetative or physical characteristics reflecting this water influence. Stream sides, lake borders, or marshes are typical riparian areas. (3)

**Riparian area** - Geographically delineated areas, with distinctive resource values and characteristics, that are comprised of aquatic and riparian ecosystems.

**Riparian ecosystem** - A transition between the aquatic ecosystem, and the adjacent upland terrestrial ecosystem. Identified by soil characteristics and distinctive vegetation communities that require free or unbound water.

**Road** - A general term denoting a way for purposes of travel by vehicles greater than 40 inches in width.

1. *Forest Arterial Road*. Provides services to large land areas and usually connects with public highways or other forest arterial roads to form an integrated network of primary travel routes. The location and standard are often determined by a demand for maximum mobility and travel efficiency rather than specific resource management service. It is usually developed and operated for long-term land and resource management purposes and constant service. (10)
2. *Forest Collector Road*. Serves smaller land areas than a forest arterial road and is usually connected to a forest arterial or public highway. Collects traffic from forest local roads and/or terminal facilities. The location and standard are influenced by both long-term multiresource service needs as well as travel efficiency. May be operated for either constant or intermittent service, depending on land use and resource management objectives for the area served by the facility. (10)
3. *Forest Local Road*. Connects terminal facilities with forest collector or forest arterial roads or public highways. The location and standard are usually controlled by specific resource activity requirements rather than travel efficiency needs. (10)

**Roadless area** - Areas studied during the Roadless Area Review and Evaluation process (RARE II) which are roadless and at least 5,000 acres in size.

**Roadless Area Review and Evaluation II (RARE II)** - The national inventory of roadless and undeveloped areas within the National Forest and Grasslands. This refers to the second such assessment, which was documented in the Final Environmental Impact Statement of the Roadless Area Review and Evaluation, January 1979. (2)

**Rotation** - Planned number of years between the formation of a generation of trees and its final harvest at a specified stage of maturity. Appropriate for even-aged management only. (6)

**Roundwood products** - Logs, bolts, or other round sections cut from trees.

**Runoff** - That part of precipitation which travels over the soil surface to the nearest outlet or channel.

**Run-of-the-river facility** - A hydropower project utilizing a diversion dam without a reservoir. Has some minor ponding, but generation is controlled by the available flow of the river.

## S

**Salable minerals** - Mineral deposits outside the scope of the General Mining Law because of widespread occurrence and common nature (disposal under the Materials Act of 1947, as amended).

**Sale preparation costs** - Costs associated with preparing a timber harvest on Forest Service lands for sale to the public; usually include all administrative costs for developing sale layout, writing an Environmental Assessment and selling the timber sale.

**Sale schedule** - The quantity of timber planned for sale by time period, from the area of suitable land covered by a Forest plan. The first period, usually a decade, of the selected sale schedule provides the allowable sale quantity. Future periods are shown to establish that long-term sustained yield will be achieved and maintained. (1) For planning purposes, the sale schedule and the allowable sale quantity are synonymous for all periods or decades over the planning horizon. (1)

**Salmonids** - Fish within the family Salmonidae; e.g., salmon and trout. (16)

**Salvage cuttings** - Intermediate cuttings made to remove trees that are dead or in imminent danger of being killed by injurious agents. (10)

**Sanitation cuttings** - Intermediate cuttings made to remove dead, damaged, or susceptible trees to prevent the spread of pests or pathogens. (10)

**Sanitation-salvage treatment** - See *Salvage Cutting; Sanitation Cutting*.

**Sawtimber** - Trees containing at least one 12-foot sawlog or two noncontiguous 8-foot logs, and meeting regional specifications for freedom from defect. Softwood trees must be at least 9 inches in diameter and hardwood trees 11 inches in diameter at breast height.

**Scarified** - Land in which the topsoil has been broken up or loosened in preparation for regenerating by direct seeding or natural seedfall. Also refers to ripping or loosening road surfaces to a specified depth for obliteration or "putting a road to bed." (3)

**Scenario** - An account or synopsis of a projected course of action or event. (20)

**Scenic River Areas** - See *Wild and Scenic River*.

**Scheduled timber harvests** - Volumes and acres programmed for harvest which are within the allowable sale quantity. This does not include salvage and sanitation harvesting.

**Scoping process** - A part of the National Environmental Policy Act (NEPA) process; early and open activities used to determine the scope and significance of the issues, and the range of actions, alternatives, and impacts to be considered in an Environmental Impact Statement. (40 CFR 1501.7)

**Second growth** - Forest growth that has become established following some interference, such as cutting, serious fire, or insect attack, with the previous Forest crop. (6)

**Sediment** - Earth material transported, suspended, or deposited by water. (6)

**Sediment Yield Index** - An estimate, derived from the Forest's sediment yield estimation model, of the total sediment (suspended load and bedload) that is transported by a stream. The estimates include sediment resulting from roading, logging, and broadcast burning activities.

**Seed tree cutting** - Removal in one cut of the mature timber from an area, except for a small number of seed bearers left singly or in small groups. (3)

**Seedlings and saplings** - Live trees less than five inches in diameter at breast height. (See also *Size Class*.) (3)

**Selection cutting** - The annual or periodic removal of trees (particularly mature trees), individually or in small groups, from an uneven-aged forest, to realize the yield and establish a new crop of irregular constitution. (3)

**Sensitive species** - Plant or animal species which are susceptible or vulnerable to activity impacts or habitat alterations. Those species that have appeared in the Federal Register as proposed for classification or are under consideration for official listing as endangered or threatened species; that are on an official State list; or that are recognized by the Regional Forester as needing special management to prevent placement on Federal or State lists. (2)

**Sensitivity analysis** - A determination of the effects of varying the level of one or more factors, while holding the other factors constant. (6) (10)

**Sensitivity level** - A measure of people's concern for the scenic quality of the National Forests. Three sensitivity levels are employed, each identifying a different level of user concern for the visual environment.

*LEVEL 1* - Highest sensitivity

*LEVEL 2* - Average sensitivity

*LEVEL 3* - Lowest sensitivity (2)

**Separate suitability components (SSC lands)** - Those forested lands tentatively suitable for timber production that grow less than 20 cubic feet per acre per year of timber but have greater than ten percent occupancy (trees cover more than ten percent of the acre).

**Sequential Upper and Lower Bounds** - A FORPLAN term referring to the constraint that sets upper and lower limits by which harvest levels can increase or decrease from decade to decade. This constraint constitutes a departure from nondeclining flow and allows the harvest to rise or fall by decade according to the bounds that are set. (See *Constraint*.)

**Seral** - A biotic community which is a developmental, transitory stage in an ecologic succession. (6)

**Shelterwood** - The cutting method that describes the silvicultural system which provides a source of seed and/or protection for regeneration, and the old crop (the shelterwood) is removed in two or more successive shelterwood cuttings. The first cutting is ordinarily the seed cutting, though it may be preceded by a preparatory cutting, and the last entry is the final cutting. Any intervening cutting is termed removal cutting. An even-aged stand results. (3)

**Shelton Cooperative Sustained Yield Unit (SCSYU)** - An area of land that includes both National Forest and private (Simpson Timber Company) lands. This area is cooperatively managed for a sustained yield of timber. Also referred to as "The Unit," or CSYU

**Silvicultural examination** - The process used to gather the detailed in-place field data needed to determine management opportunities and direction for the timber resource within a small subdivision of a Forest area, such as a stand.

**Silviculture** -The art and science of controlling the establishment, composition, and growth of forests. (2)

**Single-tree selection** - See *Individual (Single) Tree Selection*.

**Site Development Plan** - A document containing information, data and drawings essential to the reconstruction of existing facilities or development of future facilities on a given site within the National Forest.

**Site index** - A numerical evaluation of the quality of land for plant productivity, (6) based on the height of dominant trees in a stand at an arbitrarily chosen age. (3)

**Site preparation** - 1) An activity (such as prescribed burning, disking, and tilling) performed in advance of reforestation, to ensure adequate survival and growth of the future crop; or 2) manipulation of the vegetation or soil of an area prior to planting or seeding. The manipulation follows harvest, wildfire, or construction in order to encourage the survival and growth of favored species. Site preparation may include the application of herbicides, burning, or cutting living vegetation that competes with the favored species; tilling the soil; or burning of organic debris (usually logging slash).

**Site productivity** - Production capability of specific areas of land.

**Size class** - For the purposes of Forest planning, size class refers to a range of stem diameters used for classifying timber in the Forest Plan data base.

*SEEDLING / SAPLING* = less than five-inch diameter

*POLE / SAPLING OR POLE TIMBER* = five-inch to nine-inch diameter

*SAWTIMBER* = greater than nine-inch diameter

**Skidding** - A general term for moving logs by sliding; not on wheels; developed originally from "skidways" to move logs from stump to roadside, deck, skidway, or other landing.

**Skyline logging** - A system of cable yarding in which all or part of the weight of the logs is supported by a suspended cable.

**Slash** - The residue left on the ground after timber harvest, and/or accumulations that result from storm, fire, girdling or poisoning. It includes unutilized logs, uprooted stumps, broken or uprooted stems, the heavier branchwood, etc.

**Small game** - Birds and small mammals normally hunted or trapped as defined by State regulations. (2)

**Small sawtimber** - Trees (9.0-20.9 inches DBH) that will yield logs suitable in size and quality for the production of lumber. (3—Definition modified.)

**Smolt** - The juvenile life stage of salmon or steelhead trout migrating to the ocean and undergoing physiological changes from a freshwater existence to a saltwater existence. (16)

**Snag** - A standing dead tree.

**Socioeconomic** - Pertaining to, or signifying the combination or interaction of social and economic factors. (2)

**Softwoods** - Coniferous trees, usually evergreen, having needles or scale-like leaves.

**Soil** - The portion of the earth's surface consisting of disintegrated rock and humus. (7)

**Soil productivity** - The capacity of a soil to produce a specific crop such as fiber or forage under defined levels of management. Productivity is generally dependent on available soil moisture and nutrients, and length of growing season.

**Soil Resource Inventory (SRI)** - See *Soil Surveys*.

**Soil surveys** - Systematic examinations of soils in the field and in laboratories; their description and classification; the mapping of kinds of soil; the interpretation according to their adaptability for various crops, grasses, and trees; their behavior under use or treatment for plant production or for other purposes; and their productivity under different management systems. (6)

**Soil texture** - The relative proportions of the various soil separates in a soil, described by the classes of soil texture. Twelve basic soil texture classes are recognized, such as "loam." The textural classes may be modified by the addition of suitable adjectives when coarse fragments are present in substantial amounts; for example, "stony loam."

**Spawning habitat** - Aquatic environments that provide adequate gravel, water quality properties and flow characteristics suitable for spawning and subsequent egg incubation.

**Special Interest Areas** - Areas managed to make recreation opportunities available for the understanding of the earth and its geological, historical, archeological, botanical, and memorial features. (6)

**Special Management Areas (SMA)** - Areas of unusual public interest or other significance, e.g., wilderness, primitive areas, scenic areas, or archeological areas. SMAs do not require formal designation, however, Special Interest Areas do. (10)

**Special Use Permit** - A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of National Forest land for some special purpose.

**Spotted Owl Habitat Area (SOHA)** - A habitat area designated to support one pair of northern spotted owls. (2)

**Spotted owl network** - All lands contained in SOHAs and all suitable spotted owl habitat contained in management prescriptions which preclude timber harvest.

**Stand (tree stand, timber stand)** - An aggregation of trees or other vegetation occupying a specific area and sufficiently uniform in species composition, age arrangement, and condition as to be distinguishable from the forest or other vegetation or land cover on adjoining areas. (2)

**Stand diversity** - Any attribute that makes one timber stand biologically or physically different from other stands. This difference can be measured by, but not limited to: different age classes; species; densities; or non-tree floristic composition.

**Stand examination surveys** - Procedures to collect data on Forest stands.

**Standard** - A statement which describes a condition when a job is done properly. Standards show how well something should be done, rather than what should be done. (6)

**Standards and Guidelines** - Principles specifying conditions or levels of environmental quality to be achieved.

**Statewide Comprehensive Outdoor Recreation Plan (SCORP)** - The Statewide Comprehensive Outdoor Recreation Plan for the State of Washington.

**Stocking** - The degree of land occupancy by trees as measured by basal area or number of trees and compared to a stocking standard that is the basal area or number of trees required to fully use the growth potential of the land.

**Stream blockage** - Accumulation of soil, rock, and organic material deposited in a stream channel by landslides that prevent fish from moving upstream.

**Stream buffer** - Vegetation left along a stream channel to protect the channel or water from the effects of logging, road building, or other management activity. (See *Vegetation Leave Area*.)

**Stream class** - Classification of streams based on the present and foreseeable uses of the water, and the potential effects of on-site changes on downstream uses. Four classes are defined:

*CLASS I* - Perennial or intermittent streams that: provide a source of water for domestic use; are used by large numbers of fish for spawning, rearing or migration; and/or are major tributaries to other Class I streams.

*CLASS II* - Perennial or intermittent streams that: are used by moderate though significant numbers of fish for spawning, rearing or migration, and/or may be tributaries to Class I streams or other Class II streams.

*CLASS III* - All other perennial streams not meeting higher class criteria.

*CLASS IV* - All other intermittent streams not meeting higher class criteria. (10)

**Stream flow** - The flow of water, generally with its suspended load, down a well-defined water course. (6)

**Streamside Management Unit (SMU)** - An area of varying width adjacent to a stream where practices that might affect water quality, fish, and other aquatic resources are modified to meet water quality goals, for each class of stream. The width of this area will vary with the management goals for each class of stream, characteristics of the stream and surrounding terrain, and the type and extent of the planned activity.

**Stream structure** - The arrangement of logs, boulders, and meanders which modify the flow of water, thereby causing the formation of pools and gravel bars in streams. Generally, there is a direct relationship between complexity of structure and fish habitat. Complex structure is also an indication of watershed stability.

**Structural habitat components** - The configuration of elements, pans, or constituents of a habitat. (3— Definition modified.)

**Stumpage (stumpage value)** - The value of timber as ft stands uncut, in terms of an amount per unit of volume. (6)

**Substantive comment** - A comment that provides factual information, professional opinion, or informed judgment germane to the action being proposed. (10)

**Successional stage** - A stage or recognizable condition of a plant community that occurs during its development from bare ground to climax; for example, coniferous forests in the Blue Mountains progress through six recognized stages: grass-forb; shrub-seedling; pole-sapling timber; young timber; mature timber; old-growth timber. (2)

**Suitability** - The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices. (1) (2) (FSM 1905)

**Suitable Forest land** - Land to be managed for timber production on a regulated basis.

**Supply** - The amount of an output that producers are willing to provide at the specified price, time period, and condition of sale.

**Supply Schedule (Curve)** - A schedule of amounts of an output that producers are willing to provide at a range of prices, at a given point in time and condition of sale. (See *Price-Quantify Relationship*.)

**Suppression** - The process of extinguishing or confining fire. (2)

**Suspended sediment** - Any material carried in suspension by water, which will ultimately settle to the bottom. (16)

**Sustained-yield of products and services** - The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest System without impairment of the productivity of the land. (1) (6)

**System trail** - A narrow travel way which is managed and maintained on a regular basis to specific trail standards.

## T

**Technology change** - A change in the relationship between inputs and outputs in a production process resulting from the implementation of new technology, or a new application of existing technology. (10)

**Tentatively suitable Forest land** - Forest land that is producing or is capable of producing crops of industrial wood and: (a) has not been withdrawn by Congress, the Secretary, or the Chief; (b) existing technology and knowledge is available to ensure timber production without irreversible damage to soils productivity, or watershed conditions; (c) existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that it is possible to restock adequately within five years after final harvest, and (d) adequate information is available to project responses to timber management activities.

**The Nature Conservancy (TNC)** - A private organization whose primary function consists of the acquisition of land which The Nature Conservancy believes should be under management by a public agency. The land usually has some specific environmental or conservation value attached to it; such as land which fits one of the ecological niches identified for inclusion in the Research Natural Area program, or which has some unique values for wildlife management.

**Theoretical capacity** - The maximum annual amount of recreation use a developed site is designed to accommodate.

**Thermal cover** - Cover used by animals to ameliorate effects of weather.

**Thinning** - A felling made in an immature stand primarily to maintain or accelerate diameter increment and also to improve the average form of the remaining trees without permanently breaking the canopy. An intermediate cutting. (3)

**Threatened species** - Those plant or animal species likely to become endangered throughout all or a significant portion of their range within the foreseeable future. A plant or animal species identified by the Secretary of Interior as threatened in accordance with the 1973 Endangered Species Act. (See also *Endangered Species*.) (2)

**Tiering** - Refers to the coverage of general matters in broader environmental impact statements (such as National program or policy statements) with subsequent narrower statements or environmental analyses (such as Regional or Basin-wide program statements, or ultimately, site-specific statements) incorporating, by reference, the general discussions and concentrating solely on the issues specific to the statement subsequently prepared. (40 CFR 1508.28)

**Timber classification** - Forest land is classified under each of the land management alternatives according to how it relates to the management of the timber resource. The following are definitions of timber classifications used for this purpose.

1. *Nonforest* - Land that has never supported forests and land formerly forested where use for timber production is precluded by development or other uses.
2. *Forest* - Land at least 10-percent stocked (based on crown cover) by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use.
3. *Suitable* - Commercial forest land identified as appropriate for timber production in the forest planning process.
4. *Unsuitable* - Forest land withdrawn from timber utilization by statute or administrative regulation (for example, wilderness) or identified as not appropriate for timber production in the forest planning process.

**Timber harvest schedule** - See *Sale Schedule*.

**Timber Management** - The management of the forest to enhance production of wood products for commercial use. (16)

**Timber Management Resource Plan (TM Plan)** - A functional resource plan which establishes a sale volume to be sold each year based upon an analysis of the most recent resource inventories. This plan is an integrated plan which considers implications to other resources on the Forest.

**Timber production** - The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use. For purposes of Forest planning, the term "timber production" does not include production of fuelwood or harvest of unsuitable lands. (1) (2)

**Timber Sale Program Quantity** - The volume of timber planned for sale during the first decade of the planning horizon. It includes the allowable sale quantity (chargeable volume) and any additional material (nonchargeable volume) planned for sale. Expressed as the average for the first decade.

**Timber stand improvement (TSI)** - Measures such as thinning, pruning, release cutting, prescribed fire, girdling, weeding, or poisoning of unwanted trees aimed at improving the growing condition of the remaining trees. (2)

**Topography** - The configuration of a surface including its relief, elevation, and the position of its natural and human-created features. (6)

**Total suspended particulates (TSP)** - Any finely divided material (solid or liquid) that is airborne with an aerodynamic diameter smaller than a few hundred micrometers.

**Tractor logging** - Any logging method which uses a tractor as the motive power for transporting logs from the stumps to a collecting point--whether by dragging or carrying the logs. (3)

**Tradeoff** - The combination of benefits and costs which are gained and lost in switching between alternative courses of action. Trade-offs include only those portions of benefits and costs which are not common to all alternative courses of action under consideration. (6)

**Trailhead** - An area at the beginning of a trail with facilities ranging from roadside parking to a parking lot with toilets.

**Trail Management Objective** - The Primary Management Objective or planned type (hiker, ORV, stock etc.), difficulty level (easiest, more difficult, and most difficult) and level of use (low, moderate or heavy) a trail is designed and maintained to serve.

**Transitory range** - Land that is suitable for grazing use of a nonenduring nature over a period of time; often found in the openings created by timber harvesting activities. For example, on particularly disturbed lands, grass may cover the area for a period of time before being replaced by trees or shrubs not suitable for forage. (6)

**Treasury deposit** - Forest cash income, less payments to counties. Calculated by subtracting direct costs and payments to counties from total Forest receipts. These represent actual deposits from the Forest to the Treasury.

**Turbidity** - The degree of opaqueness, or cloudiness, produced in water by suspended particulate matter, either organic or inorganic. Measured by light filtration or transmission and expressed in Jackson Turbidity Units (JTUs) or Nephelometric Turbidty Units (NTUs).

## U

**Unavailable Forest land** - Land that can grow productive forest crops (timber) but has been legislatively or administratively allocated to forest uses that preclude timber harvest.

**Understory** - The trees and other woody species growing under a more-or-less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth. (6)

**Undeveloped area** - Portion of the National Forest that is essentially unroaded.

**Undeveloped recreation** - A general term referring to recreation use outside developed recreation sites, this includes activities such as scenic driving, hiking, backpacking, hunting, fishing, snowmobiling, horseback riding, cross-country skiing, and recreation in primitive environments. (2)

**Uneven-aged management** - The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection. (1)

**Uneven-aged silviculture systems** - The combination of actions that result in the creation of forests or stands of trees, in which trees of several or many ages grow together. Cutting methods that develop and maintain uneven-aged stands are individual tree and group selecting cutting methods:

*INDIVIDUAL TREE SELECTION CUTTING* - The removal of selected trees of all size classes on an individual basis.

*GROUP SELECTION CUTTING* - The removal of all trees in groups for regeneration purposes. The size of the group will be small enough in area that all subsequent regeneration will be influenced by the surrounding uncut stand. Cuts are generally .25 - 2.0 acres in size.

**Unplanned ignition** - A fire started at random by either natural or human causes, or a deliberate incendiary fire.

**Unsuitable Forest Land** - Forest land not managed for timber production because: (a) Congress, the Secretary of Agriculture, or the Chief of the Forest Service has withdrawn it; (b) it is not producing or capable of producing crops of industrial wood; (c) technology is not available to prevent irreversible damage to soils, productivity, or watershed conditions; (d) there is no reasonable assurance, based on existing technology and knowledge, that it is possible to restock lands within five years after final harvest, as reflected in current research and experience; (e) there is, at present, a lack of adequate information about responses to timber management activities; or (t) timber management is inconsistent with or not cost-efficient in meeting the management requirements and multiple-use objectives specified in the Forest Plan. (10)

**Utility corridor** - A strip of land, up to approximately 600 feet in width, designated for the transportation of people, energy, commodities, and communications by: railroad, state highway, electrical power transmission (66 KV and above), and/or oil, gas, and coal slurry pipelines 10 inches in diameter and larger; and telecommunication cable and electronic sites for interstate use. (1)

**Utilization standards** - Standards guiding the projection of timber yields and the use and removal of timber. The standards are described in terms of minimum diameter at breast height, minimum length, and percent soundness of the wood, as appropriate. (1)

## V

**Variety Classes** - A particular level of visual variety or diversity of landscape character. Variety Classes are obtained by classifying the landscape into different degrees of variety based on the premise that all landscapes have some value, but those with the most variety or diversity have the greatest potential for high scenic value.

There are three variety classes which identify the scenic quality of the natural landscape:

*CLASS A (DISTINCTIVE)* - Areas with landforms, water features, vegetative patterns, or rock formations that create a landscape of unusual and outstanding visual quality.

*CLASS B (COMMON)* - Areas with landscape features that provide an average amount of variety and create a landscape that is common to the area.

*CLASS C (MINIMAL)* - Areas with little change in their landscape features and little scenic quality.

**Vegetation leave area** - Area of land in which vegetation is left undisturbed in order to provide shade and organic debris to streams, or to prevent the acceleration of natural erosion processes. No regulated timber harvest is planned in these areas.

**Vegetative management** - Activities designed primarily to promote the health of the crop forest cover for multiple-use purposes.

**Vertical relief** - A contour variation of the land surface perpendicular in relation to the surrounding land. (3) (4)

**Viable population** - A population which has adequate numbers and dispersion of reproductive individuals to ensure the continued existence of the species population on the planning area. (FSM 1905)

**Viewshed** - Portion of the Forest that is seen from a major travel route, or high use location.

**Viewshed Schedule** - A document identifying management direction for meeting the goal and desired future condition described for areas allocated to the Scenic A2 management prescription.

**Visual Absorption Capacity (VAC)** - The physical capability of the land to support management activities without significantly affecting its visual character. Rated as high, moderate, and low.

HIGH (H) - High visual capability to absorb change.

MODERATE (M) - Moderate visual capability to absorb change.

LOW (L) - Low visual capability to absorb change.

**Visual Enhancement** - A short-term management alternative which is done with the express purpose of increasing positive visual variety where little variety now exists. (2)

**Visual Management System** - A process for identifying the visual characteristics of National Forest landscapes for the purpose of planning and analyzing ways to maintain or upgrade an area's scenic values and design resource management activities in order to minimize their visual effects as viewed from public use areas.

**Visual Prescription** - Management guidelines aimed at meeting Visual Quality Objectives. Visual prescriptions are identified by two major factors: Visual Quality Objective and Distance Zone.

**Visually Sensitive Area** - A viewshed seen from Visual Sensitivity Level One or Two—travel routes, use areas, or water bodies.

**Visual quality objective (VQO)** - Categories of acceptable landscape alteration measured in degrees of deviation from the natural-appearing landscape.

PRESERVATION (P) - Provides for ecological changes only.

RETENTION (R) - Management activities should not be evident but remain visually subordinate to the characteristic landscape.

MODIFICATION (M) - Management activities may dominate the characteristic landscape but must, at the same time, follow naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in foreground or middleground.

MAXIMUM MODIFICATION (MM) - Management activities may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

**Visual resource** - The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors. (2)

**Visual Sensitivity Level** - A particular degree or measure of viewer interest in the scenic qualities of the landscape:

1. *LEVEL ONE* - High viewer interest.
2. *LEVEL TWO* - Moderate viewer interest.
3. *LEVEL THREE* - Low viewer interest. (17)

## W

**Water Influence Zone (WIZ)** - An area comprised of aquatic, riparian, and adjacent terrestrial ecosystems. Includes flood plains, wetlands, and other lands adjacent to streams and lakes that can directly influence aquatic and riparian habitats. (10)

**Water rights** - Rights to divert and use water or to use it in place.

**Water yield** - The measured output of the Forests streams. (6)

**Watershed** - The entire land area that contributes water to a drainage system or stream. (6)

**Watershed Impact area** - Areas within a watershed that are being affected by harvesting, road building, etc. Impact areas are limited to a percent of the total watershed area by the Standards and Guidelines in Chapter IV of the Forest Plan.

**Westside Zone** - The portion of the Olympic National Forest that includes the Soleduck and Quinault Ranger Districts and the Satsop Block area of the Hood Canal Ranger District.

**Wetlands** - Areas that are inundated by surface or ground water often enough to support, and usually do support plants and animals that require saturated or seasonally saturated soil conditions for growth and reproduction. (E.O. 11990)

**Wild and Scenic River** - Those rivers or sections of rivers designated as such by congressional action under the 1968 Wild and Scenic Rivers Act, as supplemented and amended, or those sections of rivers designated as wild, scenic, or recreational by an act of the legislature of the state or states through which they flow. Wild and scenic rivers may be classified and administered under one or more of the following categories:

1. **WILD RIVER AREAS** - 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.
2. **SCENIC RIVER AREAS** - Those rivers or sections of rivers that are free of impoundments, with watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
3. **RECREATIONAL RIVER AREAS** - 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. (2) (6)

**Wilderness** - Areas designated by congressional action under the 1964 Wilderness Act. Wilderness is defined as undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitation. Wildernesses are protected and managed to preserve their natural conditions, which generally appear to have been affected primarily by the forces of nature with the imprint of human activity substantially unnoticeable; have outstanding opportunities for solitude or a primitive and unconfined type of recreation; are of sufficient size to make practical their preservation, enjoyment, and use in an unimpaired condition; and may contain features of scientific, educational, scenic, or historical value as well as ecologic and geologic interest. Five Wildernesses were designated as a result of the Washington Wilderness Act of 1984. (2)

**Wilderness Implementation Schedule** - A document providing management direction aimed at meeting the goal and desired future condition for areas allocated to the Wilderness B1 management prescription.

**Wilderness Resource Spectrum (WRS)** - A framework for stratifying and defining classes of Wilderness environment, activities, and experience opportunities. The settings, activities, and opportunities for obtaining experiences have been arranged along a continuum or spectrum divided into the following classes:

*CLASS I (LEAST PRISTINE)*

An area that is characterized by a predominantly unmodified natural environment. The area generally receives high to very high use and day use may be a significant portion of the visitation. Evidence of other users within the area is high and campsites may be present. Fire rings at campsites may be present where campfires are permitted. System trails are present and their difficulty level generally ranges from Easiest to More Difficult. Stock users may stay overnight. Visitors will generally not experience a high level of solitude, risk, or challenge. Rustic signs and structures may be present. There will be a high frequency of contact with management personnel. This is a semi-primitive and the least pristine WRS class.

*CLASS II*

An area that is characterized by an unmodified natural environment. The area generally receives moderate to high use and day use may be a minor portion of the visitation. Evidence of other users within the area is moderate and campsites may be present. Fire rings at campsites may be present where campfires are permitted. System trails are present and their difficulty level generally ranges from More Difficult to Most Difficult. Stock users infrequently stay overnight. Visitors will generally have a moderate level of solitude, risk, and challenge. Rustic signs and structures may be present. There will be a moderate frequency of contact with management personnel. This is a semi-primitive WRS class.

*CLASS III*

An area that is characterized by an unmodified natural environment. The area generally receives low to moderate use and day use may be a minor portion of the visitation. Evidence of other users within the area is low to moderate and campsites without fire rings exist but are not noticeable from other campsites. System trails are not present. Stock users infrequently stay overnight. Visitors will generally have a high level of solitude, risk, and challenge. There are no signs or structures. There will be a low frequency of contact with management personnel. This is a primitive WRS class.

*CLASS IV (MOST PRISTINE)*

An area that is characterized by an unmodified natural environment. The area generally receives very low to low use and there is generally no day use. Evidence of other users within the area is very low and campsites and fire rings do not exist. System trails are not present. Stock users do not visit this area. Visitors will have a high level of solitude, risk, and challenge. There are no signs or structures. There will be a very low frequency of contact with management personnel. This is the most pristine WRS class.

**Wildfire** - Any wildland fire that is not a prescribed fire (see also *Prescribed Fire*). (2)

**Wildlife and Fish User Day (WFUD)** - Twelve visitor hours which may be aggregated continuously, intermittently, or simultaneously by one or more persons.

**Windthrow** - See *Blowdown*.

**Withdrawal** - A legislative or administrative order removing specific land areas from availability for certain uses.

**Wood fiber production** - The growing, tending, harvesting, and regeneration of harvestable trees.

**Woody material** - Organic materials necessary for stream channel stability and maintenance of watershed condition. It includes large logs and root wads.

**Working circle (WC)** - The primary unit of forest management, with well-defined boundaries, usually based on topography, large enough to furnish a sustained yield of forest products sufficient to support dependent communities or industries. (6)

**Working group** - A term used for planning purposes to identify and group the major commercial tree species harvested from the Forest. These classifications are based on the vegetative potential of a site and not necessarily the actual vegetative occupancy of the site. Working groups are further stratified by productivity potential.

## **X,Y,Z**

**Xeric** - A dry soil moisture regime. Some moisture is present but does not occur at optimum levels for plant growth. Irrigation or summer fallow is often necessary for crop production. (3)

**Yarding** - Hauling timber from the stump to a collection point. (2)

**Yield tables** - Tables that estimate the level of outputs that would result from implementing a particular activity. Usually referred to in conjunction with FORPLAN input or output. Yield tables can be developed for timber volumes, range production, soil and water outputs, and other resources.

**Zone of Influence** - The geographic area whose social, economic and/or environmental condition is significantly affected by changes in Forest resource production or management.

# Appendix A

## Project Schedules



Olympic National Forest

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# **APPENDIX A**

## **PROJECT SCHEDULES**

This appendix includes the schedule of projects and activities needed to achieve the outputs contained in Table IV-1 of Chapter IV, including the timber sale activity schedule.

The project schedules displayed here have been developed to facilitate transition in management from current direction to direction described in Chapter IV of this Forest Plan. This requires a “phase in” period for many programs. Also, outputs displayed elsewhere in this Plan, and in the FEIS, are average annual outputs. These schedules are specific to individual years within the first decade and fluctuate up or down from the average annual figures. However, they do approximate the decade totals.

The project schedules sometimes were developed from existing action plans and inventories, as well as activities developed specifically for this Plan. In some cases, the project list calls for new inventories or resource management schedules which will result in new projects and priorities. This will require periodic updating of the schedules displayed in this appendix. It is also expected that these schedules will need to be updated or adjusted annually to reflect results of the budgeting process and new action plans.

## **TIMBER SALE PROGRAM SCHEDULE**

The timber sale schedule has been developed using the concept of Integrated Resource Analysis Areas (IRAAs). 164 IRAAs have been delineated on the Forest based largely on watershed boundaries. These areas are considerably smaller geographic areas than can be reasonably analyzed within the FORPLAN model. The timber outputs for the 21 major drainages defined in the FORPLAN solution have been disaggregated to the IRAAs based on acres of suitable land within species/productivity groups and management areas within each IRAA. Scheduling and volume goals are therefore directly tied to the FORPLAN model while considering more site specific issues, concerns, and opportunities (ICOs) for each IRAA.

Individual timber sale project decisions will be derived from the NEPA analyses completed during Plan implementation. The Integrated Resource Analysis will be used for scoping of ICOs and providing a framework upon which to base project level environmental analyses as documented in an environmental assessments (EA). This process ties the Forest Plan to the project decision in a meaningful way which does not assume a higher level of site specific analysis in the Forest Plan than actually exists.

A map of IRAAs has been included with the alternative maps This map has been printed on transparent paper for overlay with the Forest Plan map, Alternative C-Preferred. The management areas within each IRAA can be determined by the map overlay. Each IRAA has been numbered on the map allowing location of the sale area IRAAs specified in this timber sale program schedule.

**TIMBER SALE PROGRAM SCHEDULE BY FISCAL YEAR 1991 - 2000**

Sale Area - IRAA Name/Number	Harvest Acre Goal		Harvest Volume Goal (MMBF)	
	CC	CT	CC	CT
YEAR SELL- 1991				
<b>Hood Canal Ranger District (Non-SCYU)</b>				
Fulton (05)	78		3.5	
Mt Rose (18)	32		1.5	
Big (17)	64		4.3	
Lilliwaup (16)	8		1.5	
TOTAL	182		9.8	
<b>Hood Canal (CSYU)</b>				
Harris (37)	45		2.0	
Grisdale (44)	43		2.0	
Middle Skok (27)	147		5.0	
Govey (40)		250		2.0
TOTAL	235	250	9.0	2.0
<b>Quilcene Ranger District</b>				
Rocky Brook (65)	230		6.0	
Spencer (64)	150	75	4.0	1.0
Snowcreek (53)	150		2.0	
TOTAL	530	75	12.0	1.0
<b>Quinault Ranger District</b>				
Upper Matheny (76)	180		10.0	
East Fork (88)	110		6.0	
Queets (70)	145	45	6.0	0.4
Cougar Mtn (98)	70	60	4.0	0.6
Chester (Worch) (89)	70		4.0	
Rainbow (St Rd) (96)	40		2.0	
Sams Rvr (N Thin) (72)		40		0.3
Stevens/Phillips (S Thinning) (95/93)		400		3.0
Various Small Salvage Sales	20		1.0	
TOTAL	635	565	35.0	4.3
<b>Soleduck Ranger District</b>				
Kugel Creek (126)	50		2.5	
Middle Soleduck (123)	178		6.0	
Pistol Creek (139)	60		3.0	
West Sitkum (153)	70		2.4	
East Twin (113)	70		2.3	
Tom creek (137)	70		3.5	
E Soleduck (120)	85		2.0	
E N Fk Calawah (130)	72		5.7	
Various Small Salvage Sales	100		3.0	

Sale Area - IRAA Name/Number	CC	CT	CC	CT
TOTAL	775		30.4	
YEAR SELL - 1992				
<b>Hood Canal Ranger District (Non-CSYU)</b>				
Murhut (03)	216		8.6	
Washington (14)	50		0.9	
TOTAL	266		9.5	
<b>Hood Canal Ranger District (CSYU)</b>				
Neby (41)	176		8.8	
<b>Quilcene Ranger District</b>				
Townsend creek (59)	140		5.0	
Marjack (67)	40	40	1.0	0.5
Jimmycomelately (49)	100		3.2	
Little Quilcene (58)	100		4.0	
TOTAL	380	80	13.2	0.5
<b>Quinault Ranger District</b>				
Park Boundary (73)	275		1.5	
Cook (99)	50	400	3.0	3.0
Rainbow (96)	130	200	7.0	1.5
Canoe (81)	90	100	5.0	0.8
Matheny Prairie (78)	100		5.5	
Finley (77)	180		10.0	
Various Small Salvage Sales	20		1.0	
TOTAL	845	700	46.5	5.3
<b>Soleduck Ranger District</b>				
Elk creek (154)	39		2.1	
Middle creek (110)	57		2.1	
Beaver creek (112)	77		3.5	
Little River (126)	90		3.1	
S Branch Little River (135)	230		9.7	
Rainbow creek (150)	97		4.6	
Bockman creek (129)		250		1.5
East Soleduck (120)		133		0.8
Vanous Small Salvage Sales	66		3.0	
TOTAL	656	383	28.1	2.3
YEAR SELL – 1993				
<b>Hood Canal Ranger District (Non-CSYU)</b>				
Lilliwaup (16)	176		8.0	
Fulton (05)		200		1.5
TOTAL	176	200	8.0	1.5

Sale Area - IRAA Name/Number	CC	CT	CC	CT
<b>Hood Canal Ranger District (CSYU)</b>				
LeBar (26)	170		10.0	
<b>Quilcene Ranger District</b>				
Tunnel Creek (62)	125		5.0	
Upper Big Quilcene (61)	145		4.3	
Penny Creek (60)	125		2.0	
Sleepy Hollow (56)	80		3.0	
Rocky Brook (65)		100		0.5
TOTAL	475	100	14.3	0.5
<b>Quinault Ranger District</b>				
Flatbottom (100)	180	300	10.0	2.4
S Milbourn (86)	80		4.4	
Colonel Bob (82)	100	50	5.5	0.4
Hook Branch (74)	180		10.0	
Elk Lake (84)	145		8.0	
Dilly (71)	145		8.0	
Various Small Salvage Sales	20		1.0	
TOTAL	850	350	46.9	2.8
<b>Soleduck Ranger District</b>				
Pistol Creek (139)	212		10.0	
Boundary Crk (164)	138		4.6	
Hoh (162)	26		1.4	
Lost Creek (156)	137		7.2	
Upper Soleduck (134)	42		1.7	
Shuwah Creek (133)	30		1.2	
Middle Soleduck (123)		150		0.9
WestTwin (109)		217		1.3
Various Small Salvage Sales	42		2.1	
TOTAL	627	367	28.2	2.2
YEAR SELL- 1994				
<b>Hood Canal Ranger District (Non-CSYU)</b>				
Grisdale (44)	45		2.2	
Schafer (36)	55		2.8	
E Wynoochee (34)	35		1.8	
Canal (10)	100		2.4	
TOTAL	235		9.2	
<b>Hood Canal Ranger District (CSYU)</b>				
Vance (43)	103		6.8	
Rock (42)		300		2.4
TOTAL	103	300	6.8	2.4

Sale Area - IRAA Name/Number	CC	CT	CC	CT
<b>Quilcene Ranger District</b>				
Marjack (67)	75	100	2.7	1.3
Jimmycomelately (49)	100		3.2	
Cedar Flat (57)	140		3.0	
Caraco Creek (48)	110		2.0	
<b>TOTAL</b>	<b>425</b>	<b>100</b>	<b>10.9</b>	<b>1.3</b>
<b>Quinault Ranger District</b>				
Lost (92)	160		8.7	
Middle Matheny (79)	130		7.0	
Sweet (97)	130	250	7.0	2.0
Park Boundary (73)	180		10.0	
Boulder (90)		100		0.8
West Shelter (85)	145		8.0	
W Fk Dam (91)	90		5.0	
Various Small Salvage Sales	20		1.0	
<b>TOTAL</b>	<b>855</b>	<b>350</b>	<b>46.7</b>	<b>2.8</b>
<b>Soleduck Ranger District</b>				
Lk Sutherland (119)	175		6.7	
Goodman Creek (132)	231		8.9	
Albion Creek (142)	98		5.3	
East Sitkum (148)	80		4.0	
Bockman Creek (129)		267		1.6
Upper Soleduck (134)		117		0.7
Various Small Salvage Sales	70		3.2	
<b>TOTAL</b>	<b>654</b>	<b>384</b>	<b>28.1</b>	<b>2.3</b>
YEAR SELL -1995				
<b>Hood Canal Ranger District (Non-CSYU)</b>				
Four Stream (22)	168		9.5	
<b>Hood Canal Ranger District (CSYU)</b>				
Browns (30)	205		9.7	
<b>Quilcene Ranger District</b>				
Gold Creek (52)	90		3.0	
Rocky Brook (65)	200		5.5	
Upper Big Ouu (61)	100		3.0	
Salmon Creek (50)	150		4.0	
<b>TOTAL</b>	<b>540</b>		<b>15.5</b>	

Sale Area - IRAA Name/Number	CC	CT	CC	CT
<b>Quinault Ranger District</b>				
Sams River (72)	200	100	11.0	0.8
W Boundary (75)	180	100	10.0	0.8
Stevens (95)	100	150	5.5	1.2
Phillips (93)	70	150	4.0	1.2
Salmon (80)	200		11.0	
Various Small Salvage Sales	30		1.5	
<b>TOTAL</b>	<b>780</b>	<b>500</b>	<b>43.0</b>	<b>4.0</b>
<b>Soleduck Ranger District</b>				
East Sitkum (148)	200		9.0	
Middle Sitkum (151)	150		7.6	
Bear Creek (157)	123		6.7	
Eaton Creek (160)	39		2.1	
Middle Soleduck (123)		367		2.2
Various Small Salvage Sales	36		2.8	
<b>TOTAL</b>	<b>548</b>	<b>367</b>	<b>28.2</b>	<b>2.2</b>
YEAR SELL -1996				
<b>Hood Canal Ranger District (Non-CSYU)</b>				
Hamma Hamma (11)	114		3.0	
Boulder (12)	59		3.1	
Cabin (7)	80		2.6	
<b>TOTAL</b>	<b>253</b>		<b>8.7</b>	
<b>Hood Canal Ranger District (CSYU)</b>				
Pine (28)	168		7.6	
<b>Quilcene Ranger District</b>				
Jimmycomelately (49)	70		2.5	
McDonald Creek (46)	50		1.0	
Lower Big Owl (63)	160		5.3	
Grey Wolf (51)	70		1.8	
Snow Creek (53)	160		4.0	
<b>TOTAL</b>	<b>510</b>		<b>14.6</b>	
<b>Quinault Ranger District</b>				
East Fork (88)	200		12.0	
Chester (89)	165	80	9.0	0.6
Park Boundary (73)	180		10.0	
Grouse (94)	200	200	11.0	1.6
Sams River/W Boundary (72)		200		1.6
Various Small Salvage Sales	40		2.0	
<b>TOTAL</b>	<b>805</b>	<b>480</b>	<b>44.0</b>	<b>3.8</b>

Sale Area - IRAA Name/Number	CC	CT	CC	CT
<b>Soleduck Ranger District</b>				
West Sitkum (153)	200		10.0	
Morganroth Crk (158)	96		5.3	
N Fk Sitkum (146)	166		9.0	
S Branch Little River (135)	25		1.1	
S Fk Soleduck (136)		333		2.0
Various Small Salvage Sales	60		3.0	
TOTAL	547	333	28.4	2.0
YEAR SELL - 1997				
<b>Hood Canal Ranger District (Non-CSYU)</b>				
Washington (14)	124		5.4	
Mt. Rose (18)	132		4.5	
TOTAL	256		9.9	
<b>Hood Canal Ranger District (CSYU)</b>				
Cedar (35)	142		6.3	
Vance (43)	36		1.9	
TOTAL	178		8.2	
<b>Quilcene Ranger District</b>				
Tunnel Creek (62)	125		5.0	
Dosewallips I (66)	115		3.0	
Jimmycomelately (49)	85		3.0	
Little Ouil (58)	75		3.0	
TOTAL	400		14.0	
<b>Quinault Ranger District</b>				
Finley (77)	70		4.0	
Rainbow (96)	145	100	8.0	0.8
Canoe (81)	160		9.0	
Flatbottom (100)	80		4.0	
Dilly (71)	110		6.0	
Elk Lake (84)	180		10.0	
Salmon (80)	100	150	5.5	1.2
Stevens (95)		150		1.2
Various Small Salvage Sales	40		2.0	
TOTAL	885	400	48.5	3.2
<b>Soleduck Ranger District</b>				
Middle NP Calawah (131)	121		4.7	
Camp Creek (127)	211		8.1	
Cool Creek (143)	41		1.6	
Middle Sitkum (151)	210		10.6	
West Soleduck (125)		400		2.4
Various Small Salvage Sales	60		3.0	

Sale Area - IRAA Name/Number	CC	CT	CC	CT
TOTAL	643	400	28.0	2.4
<b>Hood Canal Ranger District (Non-CSYU)</b>				
Jefferson (15)	145		6.7	
Schafer (36)		400		2.8
TOTAL	145	400	6.7	2.8
<b>Hood Canal Ranger District (CSYU)</b>				
Rock (42)	199		9.3	
<b>Quilcene Ranger District</b>				
Caraco Creek (48)	135		4.0	
Green Hill (68)	50	110	1.5	1.0
Rixon (55)	80		2.0	
Snow Creek (53)	180		4.5	
TOTAL	445	110	12.0	1.0
<b>Quinault Ranger District</b>				
West Shelter (85)	165		9.0	
Cook (99)		200		1.6
Sweet (97)	145	300	8.0	2.4
Park Soundaly (73)	200		11.0	
Queets (70)	145	45	8.0	0.4
Colonel Bob (82)	50		3.0	
Various Small Salvage Sales	40		2.0	
TOTAL	745	545	41.0	4.4
<b>Soleduck Ranger District</b>				
East Twin (113)	312		10.0	
Pysht (101)	104		4.0	
Middle Soleduck (123)	98		1.7	
Bockman Creek (129)	119		4.5	
East Sitkum (148)	108		5.4	
S Fk Soleduck (136)		333		2.0
Various Small Salvage Sales	60		2.8	
TOTAL	801	333	28.4	2.0
YEAR SELL -1999				
<b>Hood Canal Ranger District (Non-CSYU)</b>				
Big (17)	87		3.9	
Dry Mountain (23)	40		1.6	
Canal (10)		200		1.5
Hamma Hamma (11)		200		2.5
TOTAL	127	400	5.5	4.0

Sale Area - IRAA Name/Number	CC	CT	CC	CT
<b>Hood Canal Ranger District (CSYU)</b>				
Canyon (39)	116		5.1	
E Wynoochee (34)	120		4.9	
TOTAL	236		10.0	
<b>Quilcene Ranger District</b>				
Jimmycomelately (49)	80		2.2	
Dungeness (54)	30		1.0	
Dosewallips II (69)	70		1.7	
Salmon Creek (50)	150		4.0	
Canyon Creek (47)	120		3.0	
TOTAL	450		11.9	
<b>Quinault Ranger District</b>				
Upper Matheny (76)	200		11.0	
Middle Matheny (79)	165		9.0	
Phillips (93)	145	200	8.0	1.6
W Fork Dam (91)	180		10.0	
Sweet (97)	90	150	5.0	1.2
Various Small Salvage Sales	40		2.0	
TOTAL	820	350	45.0	2.8
<b>Soleduck Ranger District</b>				
West Sitkum (153)	139		9.5	
Lower SF Calawah (152)	136		6.4	
Alckee Creek (147)	204		9.6	
Mid NF Calawah (131)		333		2.0
Various Small Salvage Sales	56		2.9	
TOTAL	535	333	28.4	2.0
YEAR SELL - 2000				
<b>Hood Canal Ranger District (Non-CSYU)</b>				
Duckabush (04)	150	250	5.1	2.0
Watetickeh (08)		100		1.4
Washington (14)	30		1.4	
TOTAL	180	350	6.5	3.4
<b>Hood Canal Ranger District (CSYU)</b>				
W Wynoochee (24)	107		5.0	
Scatter (33)	84		4.2	
TOTAL	191		9.2	

Sale Area - IRAA Name/Number	CC	CT	CC	CT
<b>Quilcene Ranger District</b>				
Jimmycomelately (49)	90		3.5	
Dosewallips I (66)	140		4.0	
Snow Creek (53)	190		5.0	
Caraco Creek (48)	100		2.5	
TOTAL	520		15.0	
<b>Quinault Ranger District</b>				
Rainbow (96)	90	100	5.0	0.8
Sams River (72)	200		11.0	
Chester (89)	180	100	10.0	0.8
Boulder (90)	100	100	5.5	0.8
Elk Lake (84)	90		5.0	
Park Boundary (73)	100		5.5	
Grouse (94)	60	100	3.0	0.8
Various Small Salvage Sales	40		2.0	
TOTAL	880	400	47.0	3.2
<b>Soleduck Ranger District</b>				
S Fk Pysht (104)	70		2.5	
West Twin (109)	205		5.9	
Deep Creek (114)	71		2.1	
Indian Creek (124)	132		4.7	
West Soleduck (125)	101		3.3	
E NF Calawah (130)	140		4.0	
Pistol Creek (139)	80		2.9	
East Twin (113)		333		2.0
Various Small Salvage Sales	60		3.0	
TOTAL	859	333	28.4	2.0

**DEVELOPED RECREATION SITES  
(Unit of Measure - PAOT)**

Costs (thousands of dollars)

Project Name/Type	Number of Units 1/	Feasibility Study	Preconstruction	Construction
<b>FIRST 5 YEARS, 1991-1995</b>				
<b>Hood Canal Ranger District</b>				
Big Creek Campground/Expansion	0/200	15.0	30.0	300.0
Coho Campground/Water System Reconstruction	0/0	7.0	14.0	135.0
Oxbow Campground/Construction	0/250	13.0	26.0	260.0
<b>Quilcene Ranger District</b>				
Elkhorn Campground/Reconstruction-Expansion	100/75	13.0	26.0	260.0
Falls View Campground/Reconstruction	150/0	10.0	20.0	200.0
Rainbow Campground/Reconstruction-Expansion	45/50	7.0	14.0	140.0
<b>Quinault Ranger District</b>				
Julas Campground/Construction	0/500	37.0	75.0	750.0
Gatton Creek Campground/Reconstruction-Expansion	75/45	6.0	12.0	120.0
Willaby Campground/Reconstruct Facilities	0/0	3.0	6.0	60.0
<b>Soleduck Ranger Disttlet</b>				
Klahowya Campground/Reconstruction	275/0	14.0	28.0	275.0
Kugel Creek Campground/Construction	0/100	8.0	15.0	150.0
Klahanie Campground/Construction	0/100	5.0	10.0	100.0
<b>SECOND 5 YEARS, 1996-2000</b>				
<b>Hood Canal Ranger District</b>				
High Steel Bridge Observation/Construction	0/80	8.0	15.0	150.0
Lena Lake Campground/Reconstruction	145/0	8.0	15.0	150.0
Wynoochee Falls Campground/Construction	0/120	6.0	12.0	120.0
<b>Quilcene Ranger District</b>				
Dungeness Forks Campground/Reconstruction-Expansion	50/85	10.0	20.0	200.0
N Quilcene ORV Campground/Construction	0/100	8.0	15.0	160.0
N Quilcene Horse Campground/Construction	0/75	6.0	12.0	120.0
<b>Quinault Ranger District</b>				
Falls Creek Campground/Reconstruction-Expansion	155/125	17.0	34.0	340.0
Lower E Fork Humptulips Campground/Construction	0/60	5.0	9.0	90.0
Olallie Bike Campground/Construction	0/50	4.0	8.0	75.0
<b>Soleduck Ranger District</b>				
Hoh River Boat/Construction	0/50	4.0	8.0	75.0
S Fork Soleduck Campground/Construction	0/225	17.0	34.0	335.0

Costs (thousands of dollars)

Project Name/Type	Number of Units 1/	Feasibility Study	Preconstruction	Construction
<b>ADDITIONAL DEVELOPED SITE PROJECTS</b> (Potential projects but not expected to be completed during this planning period)				
<b>Hood Canal Ranger District</b>				
Collins Campground/Reconstruction	80/0	5.0	10.0	100.0
Coho Campground/Addition of Facility	0/0	9.0	17.0	170.0
Chetwood Campground/Reconstruction	40/0	2.0	4.0	40.0
Spider Lake Picnic/Construction	0/50	3.0	5.0	50.0
Big Creek Campground/Additional Facility	0/0	6.0	12.0	120.0
Lena Greek Campground/Expansion	0/120	4.0	8.0	80.0
Chakchak Campground/Construction	0/200	15.0	30.0	300.0
<b>Quilcene Ranger District</b>				
Lower Dowewallips Campground/Construction	0/100	8.0	15.0	150.0
East Cross Campground/Reconstruction-Expansion	50/100	12.0	24.0	225.0
Seal Rock Campground & Picnic/Reconstruction	255/0	19.0	38.0	375.0
Mt Walker Observation/Reconstruction-Expansion	50/50	8.0	15.0	150.0
<b>Quinault Ranger District</b>				
Sam's River Campground/Construction	0/100	8.0	15.0	150.0
Campbell Tree Grove Campground/Reconstruction	60/0	3.0	6.0	60.0
Willaby Campground/Reconstruction	150/0	8.0	15.0	150.0

1/ Number of existing PAOT to be reconstructed/Number of new PAOT to be constructed

## UNDEVELOPED RECREATION

Costs (thousands of dollars)

Project Name/Type	Unit of Measure	Number of Units	Feasibility Study	Preconstruction	Construction
<b>FIRST 5 YEARS, 1991-1995</b>					
<b>Hood Canal Ranger District</b>					
Undeveloped Recreation Implementation Schedule	Schedule	1	40.0		
Sanitation Facility/Reconstruction	Each	6	2.0	4.0	40.0
Jefferson Lake/Rehabilitation	PAOT	70	2.0	3.0	30.0
<b>Quilcene Ranger District</b>					
Dungeness Recreation Area Schedule	Schedule	1	10.0		
Snow Play Area/Construction	PAOT	200	3.0	5.0	50.0
Undeveloped Recreation Implementation Schedule	Schedule	1	20.0		
<b>Quinault Ranger District</b>					
Undeveloped Recreation Shelters/Construction Phase 1	Each	5	3.0	5.0	50.0
Undeveloped Recreation Implementation Schedule	Schedule	1	20.0		
Shelter/Reconstruction	Each	1	1.0	1.0	10.0
<b>Soleduck Ranger District</b>					
Undeveloped Recreation Implementation Schedule	Schedule	1	20.0		
Shelter/Construction	Each	4	2.0	4.0	40.0
BndgeDayUse	PAOT	10	1.0	2.0	15.0
<b>SECOND 5 YEARS, 1996-2000</b>					
<b>Hood Canal Ranger District</b>					
Snow Play Area/Construction	PAOT	200	3.0	5.0	50.0
Shelters/Reconstruction	Each	3	3.0	3.0	9.0
Undeveloped Recreation Rehabilitation	Each	10	5.0	10.0	100.0
Lena Creek Day Use/Rehabilitation	PAOT	25	2.0	3.0	25.0
<b>Quilcene Ranger District</b>					
Big Quilcene Viewpoint/Construction	PAOT	30	3.0	5.0	50.0
<b>Quinault Ranger District</b>					
Undeveloped Recreation Shelters/Construction Phase 2	Each	3	2.0	3.0	30.0
Undeveloped Recreation Development Schedule	Schedule	1	2.0	3.0	30.0

## TRAILS

Costs (thousands of dollars)

Project Name/Type	Unit of Measure	Number of Units	Feasibility Study	Preconstruction	Construction
<b>FIRST 5 YEARS, 1991-1995</b>					
<b>Hood Canal Ranger District</b>					
Huckleberry Creek/Construction	Mile	5.0	6.0	12.0	75.0
Spider Lake/Reconstruction	Mile	2.1	2.0	3.0	17.0
Church Creek/Reconstruction	Mile	8.5	3.0	6.0	40.0
Skokomish ORV/Construction	Mile	20.0	20.0	45.0	300.0
Bear Gulch/Construction	Mile	3.0	4.0	7.0	45.0
<b>Quilcene Ranger District</b>					
Gold Creek/Reconstruction	Mile	8.7	10.0	20.0	130.0
Seal Rock/Reconstruction	Mile	0.2	2.0	3.0	20.0
Quilcene ORV/Construction	Mile	30.0	30.0	65.0	450.0
Fails View Canyon/Reconstruction	Mile	0.6	1.0	2.0	5.0
Little Quilcene/Reconstruction	Mile	4.1	3.0	5.0	33.0
<b>Quinault Ranger District</b>					
Gallon Creek Extension/Construction	Mile	4.0	5.0	9.0	60.0
Quinault Loop Extension/Construction	Mile	3.2	6.0	11.0	125.0
Colonel Bob-Pete's Creek/Reconstruction	Mile	9.7	5.0	12.0	79.0
Quinault Lake Loop/Beach Front Reconstruction	Mile	1.2	2.0	3.0	20.0
Jules/Construction	Mile	0.5	2.0	3.0	20.0
<b>Soleduck Ranger District</b>					
Mt Muller/Construction	Mile	5.0	6.0	12.0	75.0
Spruce PAW RR/Construction	Mile	9.0	10.0	20.0	200.0
Littleton Loop/Construction	Mile	5.0	6.0	12.0	75.0
Kloshe-Nanich/Construction	Mile	3.0	4.0	7.0	45.0
Pine Mtn Botanical Area/Construction	Mile	2.0	3.0	5.0	30.0
<b>SECOND 5 YEARS, 1996-2000</b>					
<b>Hood Canal Ranger District</b>					
Mt Rose/Reconstruction	Mile	4.8	3.0	6.0	38.0
Dry Creek/Reconstruction	Mile	6.6	4.0	8.0	53.0
Jefferson Ridge/Reconstruction	Mite	5.5	5.0	10.0	63.0
Labar Horse Loop/Construction	Mile	17.0	19.0	38.0	255.0
Wynoochee Lake Shore/River Bridge Construction	Each	0.1	6.0	8.0	80.0
<b>Quilcene Ranger District</b>					
Mt Walker/Reconstruction	Mile	2.0	2.0	3.0	16.0
Big Quilcene/Reconstruction	Mile	5.3	4.0	7.0	43.0
Deadfall Construction	Mile	3.5	4.0	8.0	53.0
East Zion/Construction	Mile	3.5	4.0	8.0	53.0
North Zion/Construction	Mile	4.5	5.0	10.0	68.0

Costs (thousands of dollars)

Project Name/Type	Unit of Measure	Number of Units	Feasibility Study	Preconstruction	Construction
<b>Quinault</b>					
Willaby Creek/Reconstruction	Mile	1.7	1.0	2.0	14.0
Rain Forest/Reconstruction	Mile	0.6	1.0	2.0	10.0
Fitness/Construction	Mile	0.5	1.0	2.0	12.0
Quinault Loop Bridges/Reconstruction	Each	0.3	4.0	8.0	36.0
<b>Soleduck Ranger District</b>					
N. Fork Calawah ORV/Construction	Mile	20.0	20.0	45.0	300.0
Snider Ridge/Construction	Mile	3.5	4.0	8.0	53.0
Bogachiel/Construction	Mile	2.0	3.0	5.0	30.0
Klahanie Eagle/Construction	Mile	2.0	2.0	3.0	16.0
Baldy Ridge/Construction	Mile	8.0	9.0	18.0	120.0
ADDITIONAL TRAIL PROJECTS (Potential projects but not expected to be completed during this planning period)					
<b>Hood Canal Ranger District</b>					
Big Creek Loop/Reconstruction	Mile	1.1	1.0	2.0	8.0
Big Creek/Reconstruction	Mile	1.0	2.0	4.0	28.0
Wynoochee CRV/Construction	Mile	20.0	22.0	45.0	300.0
Nature Trail/Construction	Mile	2.5	3.0	6.0	38.0
Church Creek Shelter/Reconstruction	Mile	0.7	1.0	2.0	8.0
<b>Quilcene Ranger District</b>					
Bear Mountain/Reconstruction	Mile	2.0	3.0	5.0	30.0
Ned Hill/Reconstruction	Mile	1.0	1.0	2.0	8.0
Quilcene ORV/Construction	Mile	30.0	34.0	68.0	450.0
Deadfall/Construction	Mile	3.5	4.0	8.0	53.0
East Zion/Construction	Mile	3.5	4.0	8.0	53.0
<b>Quinault Ranger District</b>					
Weilaby Creek/Construction	Mile	5.0	6.0	12.0	75.0
E Fork Humptulips/Construction	Mile	14.0	17.0	32.0	210.0
W Fork Humptulips/Reconstruction	Mile	4.0	3.0	5.0	32.0
Fletcher Canyon/Reconstruction	Mile	2.4	2.0	3.0	20.0
Sam's River/Construction	Mile	8.1	10.0	19.0	128.0
<b>Soleduck Ranger District</b>					
Elwha/Construction	Mile	2.0	3.0	5.0	30.0
Snider-Jackson/Construction	Mile	9.0	10.0	20.0	135.0

**TRAILHEADS**  
**(Unit of Measure - PAOT)**

Costs (thousands of dollars)

Project Name/Type	Number of Units 1/	Feasibility Study	Preconstruction	Construction
<b>FIRST 5 YEARS, 1991-1995</b>				
<b>Hood Canal Ranger District</b>				
Big Creek/Construction	60	3.0	3.0	22.0
Upper S Fork Skokomish/Reconstruction	60	4.0	4.0	25.0
Upper Elk Lake/Construction	50	3.0	6.0	15.0
Bear Gulch/Construction	50	3.0	5.0	25.0
Spider Lake/Construction	50	2.0	5.0	22.0
<b>Quilcene Ranger District</b>				
Little Quilcene/Reconstruction	75	3.0	5.0	50.0
Gold Creek/Reconstruction	75	3.0	5.0	75.0
Tubal Cain/Reconstruction	175	5.0	7.0	95.0
<b>Quinault Ranger District</b>				
Gallon Creek/Construction Phase 2	75	3.0	10.0	100.0
Fletcher Canyon/Reconstruction	50	2.0	4.0	20.0
<b>Soleduck Ranger District</b>				
Rugged Ridge/Reconstruction	50	2.0	4.0	15.0
Mt Muller/Construction	75	2.0	5.0	20.0
Littleton Loop/Construction	50	2.0	4.0	15.0
Kloshe-Nanich/Construction	50	2.0	5.0	15.0
Pine Mtn Botanical Area/Construction	50	2.0	3.0	25.0
<b>SECOND 5 YEARS, 1996-2000</b>				
<b>Hood Canal Ranger District</b>				
Monarch Tree Grove/Construction	50	2.0	5.0	22.0
Mt Rose/Construction	50	2.0	5.0	25.0
<b>Quilcene Ranger District</b>				
Lower Quilcene/Reconstruction	75	5.0	12.0	60.0
Big Quilcene/Reconstruction	75	3.0	5.0	50.0
Deadfall/Construction	75	5.0	7.0	75.0
Tunnel Creek (Quilcene Drainage)/Construction	80	3.0	5.0	50.0
<b>Quinault Ranger District</b>				
Quinault Botanical Area/Construction	155/125	17.0	34.0	340.0
<b>Soleduck Ranger District</b>				
N Fork Calawah ORV/Construction	50	2.0	3.0	25.0
Bogachiel/Construction	50	2.0	3.0	20.0
Klahanie Eagle/Construction	50	2.0	3.0	25.0

Project Name/Type	Number of Units 1/	Costs (thousands of dollars)		
		Feasibility Study	Preconstruction	Construction
<b>ADDITIONAL DEVELOPED SITE PROJECTS</b> (Potential projects but not expected to be completed during this planning period)				
<b>Hood Canal Ranger District</b>				
Putvin/Construction	100	3.0	6.0	30.0
Pine Lake/Construction	50	3.0	5.0	25.0
<b>Quilcene Ranger District</b>				
Tunnel Creek (Dosewallips Drainage)/Construction	80	3.0	5.0	50.0
Gray Wolf/Reconstruction	100	3.0	5.0	50.0
Dungeness/Reconstruction	260	5.0	7.0	50.0
Mt Townsend/Construction	75	5.0	7.0	75.0
<b>Quinault Ranger District</b>				
W Fork Humptulips/Construction	70	4.0	7.0	27.0
E Fork Humptulips/Construction	50	3.0	5.0	25.0
Sam's River/Construction	80	3.0	5.0	50.0
Baldy Ridge/Construction	50	2.0	3.0	25.0

## INTERPRETATION

Costs (thousands of dollars)

Project Name/Type	Unit of Measure	Number of Units	Feasibility Study	Preconstruction	Construction
<b>FIRST 5 YEARS, 1991-1 995</b>					
<b>All Districts</b>					
District interpretive Schedule	Schedule	4	20.0		
<b>Hood Canal Ranger District</b>					
Reception Office	Site	1	1.0	3.0	25.0
High Steel Bridge and Gorge	Project	1	1.0	3.0	25.0
<b>Quinault Ranger District</b>					
Quinault Sockeye Hatchery	Project	1	4.0	8.0	80.0
Quinault Loop	Project	1	2.0	6.0	20.0
Shades of Green Brochure	Project	1	1.0	2.0	10.0
<b>Soleduck Ranger District</b>					
Pine Mtn Botanical Area	Project	1	2.0	11.0	25.0
<b>SECOND 5 YEARS, 1996-2000</b>					
<b>Hood Canal Ranger District</b>					
Resource Auto Tour	Mile	20	5.0	10.0	30.0
Coho Vista	Project	1	1.0	12.0	15.0
District Brochure	Project	1	1.0	6.0	10.0
<b>Quilcene Ranger District</b>					
Falls View	Project	1	5.0	8.0	50.0
<b>Quinault Ranger District</b>					
Campbell Tree Grove	Project	1	3.0	6.0	30.0
Reception Office	Project	1	1.0	3.0	25.0
W Fork Humptulips Gorge	Project	1	3.0	6.0	25.0
<b>Soleduck Ranger District</b>					
Klahanie Eagle	Project	1	3.0	5.0	20.0
Reception Office	Site	1	1.0	3.0	25.0
<b>ADDITIONAL INTERPRETIVE PROJECTS</b> (Potential projects but not expected to be completed during this planning period)					
<b>Hood Canal Ranger District</b>					
District Video	Project	1	3.0	4.0	36.0
Highway 101 Interpretive Station	Project	1	7.0	9.0	14.0
Denny Ahi	Project	1	8.0	10.0	94.0
Alaska Cedar Botanical Area	Project	1	2.0	6.0	30.0
Nature Trail	Project	3	4.0	8.0	45.0

## WILDERNESS

Project Name/Type	Unit of Measure	Number of Units	Costs (thousands of dollars)		
			Feasibility Study	Preconstruction	Construction
<b>FIRST 5 YEARS, 1991-1995</b>					
<b>Hood Canal Ranger District</b>					
Mt Skokomish Implementation Schedule	Schedule	1	10.0		
The Bros Implementation Schedule	Schedule	1	10.0		
Wonder Mtn Implementation Schedule	Schedule	1	10.0		
<b>Quilcene Ranger District</b>					
Buckhorn Implementation Schedule	Schedule	1	10.0		
Sensitive Plant Survey	Survey	1	60.0		
Mountain Goat Analysis	Analysis	1	100.0		
<b>Quinault Ranger District</b>					
Colonel Bob implementation Schedule	Schedule	1	10.0		
Sensitive Plant Survey	Survey	1	20.0		
Search & Rescue Schedule	Schedule	1	5.0		
<b>SECOND 5 YEARS, 1996-2000</b>					
<b>Hood Canal Ranger District</b>					
Trail Brochure	Project	1	2.0	10.0	30.0
Sensitive Plant Survey	Survey	1	10.0		
Water Quality Analysis	Analysis	1	10.0		
<b>Quilcene Ranger District</b>					
Fire Management Analysis	Analysis	1	75.0		
Water Quality Analysis	Analysis	1	75.0		
Air Quality Analysis	Analysis	1	75.0		
Site Rehabilitation	Project	1	50.0		
<b>Quinault Ranger District</b>					
Water Quality Analysis	Analysis	1	10.0		
Air Quality Analysis	Analysis	1	10.0		
Site Rehabilitation	Project	1	8.0		

**SCENERY**  
**(Unit of Measure - Schedule)**

Project Name/Type	Number of Units	Feasibility Study Costs (thousands of dollars)
FIRST 5 YEARS, 1991-1995		
<b>Hood Canal Ranger District</b>		
Scenic Byway	1	10.0
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
<b>Quilcene Ranger District</b>		
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
<b>Quinault Ranger District</b>		
Scenic Byway	2	20.0
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
<b>Soleduck Ranger District</b>		
Viewshed Schedule	2	40.0
Vegetative Management Schedule	1	10.0
SECOND 5 YEARS, 1996-2000		
<b>Hood Canal Ranger District</b>		
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
<b>Quilcene Ranger District</b>		
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
<b>Quinault Ranger District</b>		
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
<b>Soleduck Ranger District</b>		
Viewshed Schedule	1	20.0
Vegetative Management Schedule	1	10.0

## WILD AND SCENIC RIVERS

Project Name/Type	Unit of Measure	Number of Units	Feasibility Study Costs (thousands of dollars)
FIRST 5 YEARS, 1991-1995			
Hood Canal Ranger District Duckabush River/implementation Schedule	Schedule	1	30.0
Quiicene Ranger District Dungeness River/implementation Schedule	Schedule	1	17.0
Graywolf River/implementation Schedule	Schedule	1	30.0
Hood Canal & Quilcene Ranger Districts Wild & Scenic River/Boundary Designation	Project	3	25.0

## CULTURAL RESOURCES

Project Type and Name	Ranger District	Unit of Measure	Number of Units	Costs (thousands of dollars)
<b>INVENTORY</b>				
FIRST 5 YEARS, 1991-1995				
<b>Project Generated Surveys</b>				
Timber	All	1,000 Acres	50.0	200.0
Recreation	All	Projects	45.0	25.0
Lands	All	1,000 Acres	23.0	69.0
Fish & Wildlife	All	Projects	28.7	5.0
Fish & Wildlife	All	1,000 Acres	1.1	1.0
Cultural Resources	All	Projects	1.0	2.0
Fire Management	All	Projects	1.0	2.0
Other	All	1,000 Acres	0.1	5.0
Non-Project/General Surveys				
Priority Areas	All	1,000 Acres	50.0	200.0
<b>Overview Updates</b>	All	Projects	0.1	1.0
SECOND 5 YEARS, 1996-2000				
Project Generated Surveys	All	Miscellaneous	All	383.0
Non-Project/General Surveys	All	Miscellaneous	All	250.0
<b>Overview Updates</b>	All	Projects	1	10.0
<b>EVALUATIONS AND ASSESSMENTS</b>				
FIRSTS YEARS, 1991 -1995				
<b>Evaluations</b>				
Loueila Guard Station	Quilcene	Sites	1	2.0
Pitch Tree Site	Quilcene	Sites	1	4.0
Quiicene Ranger Station Compound	Quilcene	Sites	1	4.0
Jefferson Lake Culturally Modified Trees	Hood Canal	Sites	1	2.0
Trail Shelters	All	Sites	10	5.0
CCC RecreationWOther	All	Sites	1	3.0
Other	All	Sites	5	10.0
<b>Data Recovery</b>				
Unnamed	All	Sites	2	15.0
<b>Nominations</b>				
Interrorem	Hood Canal	Sites	1	2.0
Slab Camp Prehistoric	Quilcene	Sites	1	3.0
Louella Guard Station	Quilcene	Sites	1	5.0
CCC Administration	All	Sites	2	4.0
Others	All	Sites	2	5.0

Project Type and Name	Ranger District	Unit of Measure	Number of Units	Costs (thousands of dollars)
<b>SECOND 5 YEARS, 1996-2000</b>				
<b>Evaluations</b>				
Early Ranger Stations	All	Sites	25	10.0
Lookouts	All	Sites	50	10.0
Other	All	Sites	5	8.0
<b>Data Recovery</b>	All	Sites	2	15.0
<b>Nominations</b>	All	Sites	5	10.0
ADDITIONAL EVALUATIONS AND ASSESSMENTS (Potential projects, but not expected to be completed during this planning period)				
Railroad Logging Thematic	All	Themes	1	20.0
Spruce Division Theme	All	Themes	1	8.0
<b>PROTECTION AND ENHANCEMENT</b>				
<b>FIRST 5 YEARS, 1991-1995</b>				
<b>Interpretive Projects</b>				
Hamma Hamma Guard Station, Phase II	Hood Canal	Project	1	35.0
Interrorem Guard Station	Hood Canal	Project	1	14.3
Falls Creek CCC Community Kitchen	Quinault	Project	1	9.1
Mt Walker Observation Point	Quilcene	Project	1	93.0
Snider CCC Work Center	Soleduck	Project	1	36.0
<b>Management Plans</b>	All	Districts	5	35.0
<b>Monitoring Properties</b>	All	Sites	17	8.5
<b>SECOND 5 YEARS, 1996-2000</b>				
Interpretive Projects (Feasibility Only)				
Quilcene Museum Partnership	Quilcene	Project	1	8.0
Louella Guard Station (Interp.)	Quilcene	Project	1	7.5
Louella Guard Station (Rehab)	Quilcene	Project	1	5.0
Slab Camp Prehistoric	Quilcene	Project	1	6.5
Ned Hill Lookout	Quilcene	Project	1	5.5
<b>Management Plans</b>	All	Districts	5	35.0
<b>Monitoring Properties</b>	All	Sites	25	16.0

Project Type and Name	Ranger District	Unit of Measure	Number of Units	Costs (thousands of dollars)
<b>ADDITIONAL INTERPRETIVE PROJECTS</b>				
(Potential projects for which additional information is needed and completion is not expected during this planning period)				
<b>Interpretive Projects (Feasibility Only)</b>				
Kloshe-Nanich Northpoint Lookout (Phase II)	Soleduck	Project	1	5.0
Tubal Cain Mine	Quilcene	Project	1	3.0
Klahanie Fishing Site	Soleduck	Project	1	6.0
Phoenix Logging Railroad	Hood Canal	Project	1	4.0
Homestead	Soleduck	Project	1	2.0
Mulkey Shelter	Quinalt	Project	1	2.0
Higley Peak Lookout	Quinalt	Project	1	4.0
Norwood Barn	Quinalt	Project	1	2.0

## WILDLIFE

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>FISCAL YEAR 1991</b>					
<b>Hood Canal Ranger District</b>					
Pond/Wetland/Meadow Inventory	0	0	0	1	15.0
Pond/Wetland/Meadow Habitat Improvement	15	0	0	1	45.0
Wynoochee Reservoir Rehabilitation	5	0	0	0	15.0
Riparian Rehabilitation	20	0	0	0	15.0
Big Game Management Plan	0	0	0	1	5.0
Big Game Habitat Improvement	100	0	0	0	9.0
Road Closure Habitat Improvement	100	0	0	0	5.0
Roadside Forage improvement	10	0	0	0	18.0
Special Wildlife Sites Inventory	0	0	0	1	11.0
Raptor Nest Survey	0	0	0	1	13.0
Bat Roost/Nursery Boxes	0	5	0	0	5.0
Nesting Structure Maintenance	0	25	0	0	5.0
Wildlife Tree Inventory/Program	0	0	0	1	12.5
Wildlife Project Monitoring	0	0	0	1	6.0
Wildlife Project Maintenance	100	0	0	1	20.0
Wildlife Information & Education	0	0	0	1	5.0
<b>DISTRICT TOTAL</b>	<b>350</b>	<b>30</b>	<b>0</b>	<b>9</b>	<b>204.5</b>
<b>Quilcene Ranger District</b>					
Forage Seeding (Deer/Elk) - KV	90	0	0	0	15.0
Riparian Planting - KV	5	0	0	0	5.0
Wetland Enhancement Plant	10	0	0	0	10.0
Mountain Goat General Survey	0	0	0	1	8.0
Elk Herd Analysis	0	0	0	1	7.0
Deer Browse Project	25	0	0	0	5.0
<b>DISTRICT TOTAL</b>	<b>130</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>50.0</b>
<b>Quinault Ranger District</b>					
Ruffed Grouse Habitat Enhancement	0	0	0	0	0.0
Wetland Enhancement	0	0	0	0	0.0
Road Management/Maintenance	0	0	0	0	0.0
Big Game Forage Seeding	0	0	0	0	0.0
Habitat Enhancement	0	0	0	0	0.0
Snag Creation	0	0	0	0	0.0
Nest Boxes/Maintenance	0	0	0	0	0.0
Nest Box Monitoring	0	0	0	0	0.0
Elk Winter Range Survey	0	0	0	0	0.0
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>Soleduck Ranger District</b>					
Aerial Seeding for Big Game – KV	150	0	0	0	38.5
National Forest Calawah Elk Meadows	10	0	0	0	50.0
Understory Forage Seeding – KV	20	0	0	0	6.0
West End Elk Study	0	0	0	0	50.0
Snag Inventory	0	0	0	0	10.5
Amphibian Survey	0	0	0	0	8.0
Wetland Development	3	0	0	0	18.0
Wildlife Tree Blasting - KV	0	150	0	0	20.0
Bird Boxes	0	50	0	0	5.0
Riparian Site Conversion	0	0	0	0	20.0
Basin Elk & Deer Management Plan	0	0	0	0	15.0
Pine Marten Survey	0	0	0	0	15.0
Cavity Excavators/PW Survey	0	0	0	0	15.0
Raptor Survey	0	0	0	0	10.0
Monitoring & Maintenance	0	0	0	0	3.0
Wildlife Tree Management Plan	0	0	0	0	5.0
<b>DISTRICT TOTAL</b>	<b>183</b>	<b>200</b>	<b>0</b>	<b>0</b>	<b>289.0</b>
<b>FISCAL YEAR TOTAL</b>	<b>663</b>	<b>230</b>	<b>0</b>	<b>11</b>	<b>543.5</b>
FISCAL YEAR 1992					
<b>Hood Canal Ranger District</b>					
Pond/Wetland/Meadow Inventory	0	0	0	1	15.0
Pond/Wetland/Meadow Habitat Improvement	0	0	0	2	45.0
Wynoochee Reservoir Rehabilitation	5	0	0	0	15.0
Riparian Rehabilitation	20	0	0	0	15.0
Sub-Basin Big Game Management Plan	0	0	0	1	5.0
Nest Boxes at Denny Ahl Orchard	0	15	0	0	5.0
Big Game Habitat Improvement	100	0	0	0	9.0
Road Closure Habitat Improvement	100	0	0	0	5.0
Roadside Forage Improvement	10	0	0	0	18.0
Special Wildlife Sites Inventory	0	0	0	1	11.0
Raptor Nest Survey	0	0	0	1	13.0
Bat Roost/Nursery Boxes	0	5	0	0	5.0
Nesting Structure Maintenance	0	25	0	0	5.0
Wildlife Tree Inventory/Program	0	0	0	1	5.0
Wildlife Tree Habitat Improvement	150	0	0	0	25.0
Wildlife Project Monitoring	0	0	0	1	6.0
Wildlife Project Maintenance	100	0	0	1	20.0
Wildlife information & Education	0	0	0	1	5.0
<b>DISTRICT TOTAL</b>	<b>485</b>	<b>45</b>	<b>0</b>	<b>10</b>	<b>227.0</b>
<b>Quilcene Ranger District</b>					
Forage Seeding – KV	10	0	0	0	3.0
Riparian Planting – KV	5	0	0	0	5.0
Wildlife Area Signing – KV	5	0	0	0	1.0
Mountain Goat General Survey	0	0	0	1	8.0
Browse Project – Monitor	0	0	0	1	2.0
Road Closure	0	1	0	0	3.0
<b>DISTRICT TOTAL</b>	<b>20</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>22.0</b>

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>Quinault Ranger District</b>					
Puffed Grouse Habitat Enhancement	0	0	0	0	0.0
Wetland Enhancement	0	0	0	5	0.0
Road Management/Maintenance	0	0	0	0	0.0
Big Game Forage Seeding	0	0	0	0	0.0
Habitat Enhancement	0	0	0	0	0.0
Snag Creation	0	0	0	0	0.0
Nest Boxes Maintenance	0	0	0	0	0.0
Nest Box Monitoring	0	0	0	0	0.0
Elk Winter Range Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	5	0.0
<b>Soleduck Ranger District</b>					
Aerial Seeding - KV	150	0	0	0	39.0
West End Elk Study	0	0	0	0	50.0
Snag inventory	0	0	0	0	10.5
Wildlife Tree Blasting - KV	0	150	0	0	20.0
Riparian Site Conversion	0	0	0	0	20.0
Basin Elk & Deer Management Plan	0	0	0	0	15.0
Pine Marten Survey	0	0	0	0	15.0
Cavity Excavators/PW Survey	0	0	0	0	15.0
Monitoring & Maintenance	0	0	0	0	7.0
Fork's Burn Elk Meadow	10	0	0	0	50.0
Osprey Platforms	0	2	0	0	1.0
Grouse Inventory	0	0	0	0	10.0
Willow Plantings - KV	0	0	0	0	3.0
Road Closure Plan & Evaluation	0	0	0	0	5.0
Bonidu Plots Information & Education	0	0	0	0	3.0
DISTRICT TOTAL	160	152	0	0	263.5
FISCAL YEAR TOTAL	685	198	0	17	512.5
FISCAL YEAR 1993					
<b>Hood Canal Ranger District</b>					
Pond/Wetland/Meadow Inventory	0	0	0	1	15.0
Pond/Wetland/Meadow Habitat improvement	0	0	0	1	45.0
Wynoochee Reservoir Rehabilitation	5	0	0	0	15.0
Riparian Rehabilitation	20	0	0	0	15.0
Sub-Basin Big Game Management	0	0	0	1	5.0
Big Game Habitat Improvement	100	0	0	0	9.0
Road Closure Habitat Improvement	100	0	0	0	5.0
Roadside Forage Improvement	10	0	0	0	18.0
Special Wildlife Sites Inventory	0	0	0	1	11.0
Raptor Nest Survey	0	0	0	1	13.0
Bat Roost/Nursery Boxes	0	5	0	0	5.0
Nesting Structure Maintenance	0	25	0	0	5.0
Wildlife Tree Inventory/Program	0	0	0	1	5.0
Wildlife Tree Habitat Improvement	150	0	0	0	25.0
Wildlife Project Monitoring	0	0	0	1	6.0
Wildlife Project Maintenance	100	0	0	1	20.0
Wildlife Information & Education	0	0	0	1	5.0
DISTRICT TOTAL	465	30	0	9	222.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>Quilcene Ranger District</b>					
Nest Box Installation	0	50	0	0	3.0
Road Closure	0	1	0	0	3.0
Snag Closure	0	30	0	0	5.0
DISTRICT TOTAL	0	81	0	0	11.0
<b>Quinault Ranger District</b>					
Wetland Enhancement	0	0	0	0	0.0
Road Management/Maintenance	0	0	0	0	0.0
Big Game Forage Seeding	0	0	0	0	0.0
Habitat Enhancement	0	0	0	0	0.0
Snag Creation	0	0	0	0	0.0
Nest Boxes/Maintenance	0	0	0	0	0.0
Nest Box Monitoring	0	0	0	0	0.0
Elk Winter Range Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	0.0
<b>Soleduck Ranger District</b>					
Aerial Seeding – KV	150	0	0	0	39.0
West End Elk Study	0	0	0	0	50.0
Snag Inventory	0	0	0	0	10.5
Wildlife Tree Blasting – KV	0	150	0	0	20.0
Basin Elk & Deer Management Plan	0	0	0	0	15.0
Monitoring & Maintenance	0	0	0	0	15.0
Grouse Inventory	0	0	0	0	15.0
Road Closures	0	2	0	0	2.0
Aerial Seeding Evaluation	100	0	0	0	20.0
Wildlife Habitat Structure Improvement	0	15	0	0	20.0
Wildlife Non-Structure Improvement	10	0	0	0	50.0
DISTRICT TOTAL	260	167	0	0	251.5
FISCAL YEAR TOTAL	745	278	0	9	484.5
FISCAL YEAR 1994					
<b>Hood Canal Ranger District</b>					
Pond/Wetland/Meadow Inventory	0	0	0	1	15.0
Pond/Wetland/Meadow Habitat Improvement	0	0	0	1	45.0
Wynoochee Reservoir Rehabilitation	5	0	0	0	15.0
Riparian Rehabilitation	20	0	0	0	15.0
Sub-Basin Big Game Management	0	0	0	1	5.0
Big Game Habitat Improvement	100	0	0	0	9.0
Road Closure Habitat Improvement	100	0	0	0	5.0
Roadside Forage Improvement	10	0	0	0	18.0
Special Wildlife Sites Inventory	0	0	0	1	11.0
Raptor Nest Survey	0	0	0	1	13.0
Bat Roost/Nursery Boxes	0	5	0	0	5.0
Nesting Structure Maintenance	0	25	0	0	5.0
Wildlife Tree Inventory/Program	0	0	0	1	5.0
Wildlife Tree Habitat Improvement	150	0	0	0	25.0
Wildlife Project Monitoring	0	0	0	1	6.0
Wildlife Project Maintenance	100	0	0	1	20.0
Wildlife Information & Education	0	0	0	1	5.0
DISTRICT TOTAL	485	30	0	9	222.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>Quilcene Ranger District</b>					
Nest Box Maintenance	0	0	0	0	1.0
DISTRICT TOTAL	0	0	0	0	1.0
<b>Quinault Ranger District</b>					
Wetland Enhancement	0	0	0	0	0.0
Road Management/Maintenance	0	0	0	0	0.0
Big Game Forage Seeding	0	0	0	0	0.0
Habitat Enhancement	0	0	0	0	0.0
Snag Creation	0	0	0	0	0.0
Nest Boxes/Maintenance	0	0	0	0	0.0
Nest Box Monitoring	0	0	0	0	0.0
Elk Winter Range Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	0.0
<b>Soleduck Ranger District</b>					
Snag Inventory	0	0	0	0	10.5
Wildlife Tree Blasting - KV	0	150	0	0	20.0
Basin Elk & Deer Management Plan	0	0	0	0	15.0
West End Elk Study	0	0	0	0	50.0
Monitoring & Maintenance	0	0	0	0	20.0
Aerial Seeding - KV	150	0	0	0	39.0
Wildlife Structure improvement	0	25	0	0	40.0
Wildlife Non-Structure Improvement	10	0	0	0	50.0
DISTRICT TOTAL	160	175	0	0	244.5
FISCAL YEAR TOTAL	645	205	0	10	467.5
FISCAL YEAR 1995					
<b>Hood Canal Ranger District</b>					
Pond/Wetland/Meadow Inventory	0	0	0	1	15.0
Pond/Wetland/Meadow Habitat Improvement	0	0	0	1	45.0
Wynoochee Reservoir Rehabilitation	5	0	0	0	15.0
Riparian Rehabilitation	20	0	0	0	15.0
Sub-Basin Big Game Management	0	0	0	1	5.0
Nest Boxes at Denny Ahl Orchard	0	15	0	0	5.0
Big Game Habitat Improvement	100	0	0	0	9.0
Road Closure Habitat Improvement	100	0	0	0	5.0
Roadside Forage Improvement	10	0	0	0	18.0
Special Wildlife Sites Inventory	0	0	0	1	11.0
Raptor Nest Suivey	0	0	0	1	13.0
Bat Roost/Nursery Boxes	0	5	0	0	5.0
Nesting Structure Maintenance	0	25	0	0	5.0
Wildlife Tree Inventory/Program	0	0	0	1	5.0
Wildlife Tree Habitat Improvement	150	0	0	0	25.0
Wildlife Project Monitoring	0	0	0	1	8.0
Wildlife Project Maintenance	100	0	0	1	20.0
Wildlife Information & Education	0	0	0	1	5.0
DISTRICT TOTAL	485	45	0	9	227.0
<b>Quilcene Ranger District</b>					
Nest Box Maintenance	0	0	0	1	1.0
DISTRICT TOTAL	0	0	0	1	1.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>Quinault Ranger District</b>					
Wetland Enhancement	0	0	0	0	0.0
Road Management/Maintenance	0	0	0	0	0.0
Big Game Forage Seeding	0	0	0	0	0.0
Habitat Enhancement	0	0	0	0	0.0
Snag Creation	0	0	0	0	0.0
Nest Boxes/Maintenance	0	0	0	0	0.0
Nest Box Monitoring	0	0	0	0	0.0
Elk Management Plan	0	0	0	0	1.0
Band-Tailed Pigeon Survey	0	0	0	0	0.0
Wildlife Tree Monitoring	0	0	0	0	0.0
Elk Winter Range Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	1.0
<b>Soleduck Ranger District</b>					
Aerial Seeding - KV	150	0	0	0	390
Nest Platforms	0	3	0	0	15
Bat Roosting Improvement	0	10	0	0	30
West End Elk Study	0	0	0	0	350
Snag Inventory	0	0	0	0	105
Wildlife Tree Blasting - KV	0	150	0	0	200
Basin Elk & Deer Management Plan	0	0	0	0	150
Monitoring & Maintenance	0	0	0	0	300
Wildlife Structure Improvement	0	25	0	0	400
Wildlife Non-Structure Improvement	10	0	0	0	500
DISTRICT TOAL	160	168	0	0	244.0
FISCAL YEAR TOTAL	645	233	0	10	473.0
GRAND TOTAL	3,363	1,144	0	57	2,481.0

## FISHERIES

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>FISCAL YEAR 1991</b>					
<b>Hood Canal Ranger District</b>					
Fish Habitat/Inventory	0	0	42	0	20.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat improvement	0	10	0	0	10.0
Anadromous Fish Habitat Improvement	0	45	0	1	40.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	2	0	0	0	1.0
Fish Habitat Improvement Maintenance	0	60	0	0	3.0
<b>DISTRICT TOTAL</b>	<b>4</b>	<b>115</b>	<b>42</b>	<b>15</b>	<b>130.0</b>
<b>Quilcene Ranger District</b>					
Fish Habitat Inventory	0	0	22	0	10.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat improvement	0	15	0	0	15.0
Anadromous Fish Habitat Improvement	0	25	0	0	25.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	3	0	0	0	1.5
Fish Habitat improvement	0	50	0	0	2.5
<b>DISTRICT TOTAL</b>	<b>5</b>	<b>90</b>	<b>22</b>	<b>14</b>	<b>110.0</b>
<b>Quinault Ranger District</b>					
Habitat & Fish Inventory	0	0	75	0	37.5
Structure Maintenance	0	160	0	0	25.0
Resident Fish Habitat Improvement	3	0	0	0	10.0
<b>DISTRICT TOTAL</b>	<b>3</b>	<b>160</b>	<b>75</b>	<b>0</b>	<b>72.5</b>
<b>Soleduck Ranger District</b>					
Pistol Creek Log Jam Removal	3	0	0	6	8.5
Hyas Creek Pond	2	0	0	0	45.0
S. Fork Calawah Improvement	0	70	0	0	70.0
N Fork Sitkum Barrier Removal Plan – KV	0	0	0	0	3.0
Eagle Creek Rearing Pond	2	0	0	5	18.0
Calawah Basin Management Plan	0	0	0	0	5.5
Alckee Creek Improvement – KV	0	25	0	0	25.0
Bockman Creek Improvement – KV	0	15	0	0	15.0
Goodman Creek Improvement – KV	0	25	0	0	25.0
Stream Surveys	0	0	110	0	55.0
Monitoring & Maintenance	0	0	0	0	12.0
Fish Pond Interpretive Sites	0	0	0	0	2.0
Spawner Surveys	0	0	25	0	3.5
Resident Fish Stock Determination	0	0	0	0	30.0
<b>DISTRICT TOTAL</b>	<b>7</b>	<b>135</b>	<b>135</b>	<b>11</b>	<b>317.5</b>
<b>FISCAL YEAR TOTAL</b>	<b>19</b>	<b>500</b>	<b>274</b>	<b>40</b>	<b>630.0</b>

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>FISCAL YEAR 1992</b>					
<b>Hood Canal Ranger District</b>					
Fish Habitat Inventory	0	0	42	0	20.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	20	0	0	20.0
Anadromous Fish Habitat Improvement	0	50	0	0	50.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	4	0	0	0	2.0
Fish Habitat improvement Maintenance	0	115	0	0	5.0
<b>DISTRICT TOTAL</b>	<b>6</b>	<b>185</b>	<b>42</b>	<b>14</b>	<b>153.0</b>
<b>Quilcene Ranger District</b>					
Fish Habitat Inventory	0	0	22	0	10.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	12	50.0
Resident Fish Habitat Improvement	0	10	0	0	10.0
Anadromous Fish Habitat Improvement	0	30	0	1	30.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	3	0	0	0	1.5
Fish Habitat improvement Maintenance	0	90	0	0	3.5
<b>DISTRICT TOTAL</b>	<b>5</b>	<b>130</b>	<b>22</b>	<b>15</b>	<b>111.0</b>
<b>Quinault Ranger District</b>					
Habitat & Fish Inventory	0	0	105	0	52.5
Anadromous Fish Habitat Improvement	0	30	0	0	25.4
Structure Maintenance	0	40	0	0	5.0
Barrier Removal	0	0	0	3	30.0
Resident Fish Habitat Improvement	3	0	0	0	10.0
<b>DISTRICT TOTAL</b>	<b>3</b>	<b>70</b>	<b>105</b>	<b>3</b>	<b>122.9</b>
<b>Soleduck Ranger District</b>					
Pistol Creek Log Jam Removal – KV	1	0	0	0	6.0
Albion Creek Barrier Modification – KV	2	0	0	0	11.0
N Fork Sitkum Barrier Modification – KV	5	0	0	0	9.5
Camp Creek improvement – KV	0	60	0	0	60.0
Soleduck River Basin Management Plan	0	0	0	0	5.5
S. Fork Soleduck Improvement	0	170	2	0	240.0
Monitoring & Maintenance	0	0	0	0	21.5
Stream Surveys	0	0	100	0	50.0
Spawner Surveys	0	0	25	0	3.5
Hyas Creek Interpretive Site	0	0	0	0	1.0
Resident Fish Stock Determination	0	0	0	0	30.0
<b>DISTRICT TOTAL</b>	<b>8</b>	<b>230</b>	<b>127</b>	<b>0</b>	<b>438.0</b>
<b>FISCAL YEAR TOTAL</b>	<b>22</b>	<b>615</b>	<b>296</b>	<b>32</b>	<b>824.9</b>

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>FISCAL YEAR 1993</b>					
<b>Hood Canal Ranger District</b>					
Fish Habitat Inventory	0	0	42	0	20.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	0	0	0	0.0
Anadromous Fish Habitat Improvement	0	60	0	0	60.0
Resident Fish Habitat Improvement	4	0	0	0	2.0
Anadromous Fish Habitat Improvement	4	0	0	0	2.0
Fish Habitat Improvement Maintenance	0	185	0	0	9.0
<b>DISTRICT TOTAL</b>	<b>8</b>	<b>245</b>	<b>42</b>	<b>14</b>	<b>148.0</b>
<b>Quilcene Ranger District</b>					
Fish Habitat Inventory	0	0	22	0	10.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	20	0	0	20.0
Anadromous Fish Habitat Improvement	0	30	0	0	30.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	3	0	0	0	1.5
Fish Habitat Improvement	0	140	0	0	4.5
<b>DISTRICT TOTAL</b>	<b>5</b>	<b>190</b>	<b>22</b>	<b>14</b>	<b>122.0</b>
<b>Quinault Ranger District</b>					
Sensitive Aquatic Instream Inventory	0	0	96	0	10.0
Structure Monitoring Fish	0	30	0	0	4.0
Structure Maintenance	0	40	0	0	5.0
Anadromous Fish Habitat Improvement	0	15	0	0	15.0
Barrier Removal Monitor	0	0	0	3	4.0
Barrier Removal	0	0	0	3	30.0
Resident Fish Habitat Improvement	3	0	0	0	10.0
<b>DISTRICT TOTAL</b>	<b>3</b>	<b>85</b>	<b>96</b>	<b>6</b>	<b>78.0</b>
<b>Soleduck Ranger District</b>					
Fish Structure Improvement – KV	0	200	0	0	200.0
Fish NonStructure Improvement – KV	10	0	0	0	150.0
Stream Surveys	0	0	60	0	30.0
Spawner Surveys	0	0	25	0	3.5
Monitoring & Maintenance	0	0	0	0	30.0
Resident Fish Stock Determination	0	0	0	0	30.0
<b>DISTRICT TOTAL</b>	<b>10</b>	<b>200</b>	<b>85</b>	<b>0</b>	<b>443.5</b>
<b>FISCAL YEAR TOTAL</b>	<b>26</b>	<b>720</b>	<b>247</b>	<b>34</b>	<b>791.5</b>

FISCAL YEAR 1994

**Hood Canal Ranger District**

Fish Habitat Inventory	0	0	42	0	20.0
Fish Habitat Planning	0	0	0	4	5.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	20	0	0	20.0
Fish Habitat Improvement Maintenance	0	65	0	1	65.0
Anadromous Fish Habitat Improvement	4	0	0	0	2.0
Resident Fish Habitat Improvement	4	0	0	0	2.0
Anadromous Fish Habitat Improvement	0	245	0	0	12.0
<b>DISTRICT TOTAL</b>	<b>8</b>	<b>330</b>	<b>42</b>	<b>15</b>	<b>176.0</b>

**Quilcene Ranger District**

Fish Habitat Inventory	0	0	22	0	10.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	15	0	0	15.0
Anadromous Fish Habitat Improvement	0	25	0	0	25.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	3	0	0	0	1.5
Fish Habitat Improvement	0	180	0	0	5.5
<b>DISTRICT TOTAL</b>	<b>5</b>	<b>220</b>	<b>22</b>	<b>14</b>	<b>113.0</b>

**Quinault Ranger District**

Sensitive Aquatic Instream Inventory	0	0	75	0	10.0
Structure Monitoring Fish	0	60	0	0	10.0
Structure Maintenance	0	40	0	0	5.0
Anadromous Fish Habitat Improvement	0	15	0	0	15.0
Barrier Removal Monitor	0	0	0	6	8.0
Barrier Removal	0	0	0	3	30.0
Resident Fish Habitat Improvement	3	0	0	0	10.0
<b>DISTRICT TOTAL</b>	<b>3</b>	<b>115</b>	<b>75</b>	<b>9</b>	<b>88.0</b>

**Soleduck Ranger District**

Fish Structure Improvement – KV	0	200	0	0	200.0
Fish Non-Structure Improvement – KV	10	0	0	0	150.0
Stream Surveys	0	0	60	0	30.0
Spawner Surveys	0	0	25	0	3.5
Monitoring & Maintenance	0	0	0	0	40.0
<b>DISTRICT TOTAL</b>	<b>10</b>	<b>200</b>	<b>85</b>	<b>0</b>	<b>423.5</b>
<b>FISCAL YEAR TOTAL</b>	<b>26</b>	<b>865</b>	<b>224</b>	<b>38</b>	<b>800.5</b>

FISCAL YEAR 1995

**Hood Canal Ranger District**

Fish Habitat Inventory	0	0	42	0	20.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	5	0	0	5.0
Anadromous Fish Habitat Improvement	0	55	0	0	55.0
Resident Fish Habitat Improvement	4	0	0	0	2.0
Anadromous Fish Habitat Improvement	6	0	0	0	3.0
Fish Habitat Improvement Maintenance	0	330	0	0	16.0
<b>DISTRICT TOTAL</b>	<b>10</b>	<b>390</b>	<b>42</b>	<b>14</b>	<b>156.0</b>

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>Quilcene Ranger District</b>					
Fish Habitat Inventory	0	0	22	0	10.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	20	0	0	20.0
Anadromous Fish Habitat Improvement	0	25	0	0	25.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	3	0	0	0	1.5
Fish Habitat Improvement	0	225	0	0	6.5
DISTRICT TOTAL	5	270	22	14	119.0
<b>Quinault Ranger District</b>					
Sensitive Aquatic Instream Inventory	0	0	105	0	12.0
Structure Monitoring Fish	0	90	0	0	12.0
Structure Maintenance	0	80	0	0	10.0
Anadromous Fish Habitat Improvement	0	15	0	0	15.0
Barrier Removal Monitor	0	0	0	9	12.0
Barrier Removal	0	0	0	3	30.0
Resident Fish Habitat Improvement	3	0	0	0	10.0
DISTRICT TOTAL	3	185	105	12	101.0
<b>Soleduck Ranger District</b>					
Fish Structure Improvement – KV	0	200	0	0	200.0
Fish Non-Structure Improvement – KV	5	0	0	0	50.0
Stream Surveys	0	0	60	0	30.0
Spawner Surveys	0	0	25	0	3.5
Monitoring & Maintenance	0	0	0	0	50.0
DISTRICT TOTAL	5	200	85	0	333.5
FISCAL YEAR TOTAL	23	1,045	245	40	709.5
GRAND TOTAL	116	3,745	1,295	181	3,756.4

## THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>FISCAL YEAR 1991</b>					
<b>Hood Canal Ranger District</b>					
Bald Eagle Inventory	0	0	0	6	4.5
Bald Eagle Management Plan	0	0	0	1	5.0
Spotted Owl Monitoring	0	0	0	12	65.5
Spotted Owl Habitat Rating/Catalog	0	0	0	2	7.5
Spotted Owl Banding Program	0	0	0	20	10.0
Spotted Owl Habitat Vegetation Inventory	0	0	0	0	40.0
Spotted Owl Management Plans	0	0	0	2	12.0
Olympic Mud Minnow Inventory	0	0	0	10	25.0
Marbled Murrelet Survey	0	0	0	3	25.5
PETS Species Survey (Areas #1)	0	0	0	1	10.0
Three Peaks Botanical Area Survey	0	0	0	1	10.0
Gold Chinquapin Survey	0	0	0	3	5.0
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>61</b>	<b>220.0</b>
<b>Hood Canal/Quilcene Ranger Districts</b>					
Peregrine Falcon Cliff Survey	0	0	0	10	6.2
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>6.2</b>
<b>Quilcene Ranger District</b>					
Spotted Owl R6 Monitoring	0	0	0	10	25.0
Spotted Owl Reproduction Surveys	0	0	0	3	6.0
Marbled Murrelet Surveys	0	0	0	1	15.0
Eagle General Survey – Winter	0	0	0	1	5.0
Eagle General Survey – Breeding	0	0	0	1	5.0
Sensitive Plant Surveys	0	0	0	5	10.0
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>66.0</b>
<b>Quinault Ranger District</b>					
Marbled Murrelet Survey	0	0	0	0	0
Spotted Owl Survey	0	0	0	0	0
Bald Eagle/Osprey Nest Survey	0	0	0	0	0
Bald Eagle Communal Roost Survey	0	0	0	0	0
Sensitive Plant Survey	0	0	0	0	0
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Soleduck Ranger District</b>					
Spotted Owl Survey	0	0	0	0	25.0
Peregrine Falcon Survey	0	0	0	0	2.5
Marbled Murrelet Survey	0	0	0	0	10.0
Sensitive Plant Survey	0	0	0	0	15.0
Bald Eagle Management Plans	0	0	0	0	7.5
Photo Herbarium	0	0	0	0	1.0
Eagle Platforms – KV	0	3	0	0	3.0
Spotted Owl Habitat Typing	0	0	0	0	20.0
Marbled Murrelet Management Plans	0	0	0	0	10.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
Spotted Owl Prey District Study	0	0	0	0	10.0
Maintenance & Monitoring	0	0	0	0	1.0
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>105.0</b>
<b>FISCAL YEAR TOTAL</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>92</b>	<b>397.2</b>
<b>FISCAL YEAR 1992</b>					
<b>Hood Canal Ranger District</b>					
Bald Eagle Inventory	0	0	0	6	4.5
Bald Eagle Management Plan	0	0	0	1	5.0
Spotted Owl Monitoring	0	0	0	12	65.5
Spotted Owl Habitat Rating/Catalog	0	0	0	2	7.5
Spotted Owl Banding Program	0	0	0	20	10.0
Spotted Owl Habitat Vegetation Inventory	0	0	0	0	40.0
Spotted Owl Management Plans	0	0	0	3	15.0
Spotted Owl Habitat Recovery Plan	0	0	0	1	10.0
Olympic Mud Minnow Inventory	0	0	0	10	25.5
Marbled Murrelet Survey	0	0	0	3	25.5
PETS Species Survey (Area #2)	0	0	0	1	10.0
PETS Species Management Plan (Area #1)	0	0	0	1	10.0
Three Peaks Botanical Area Plan	0	0	0	1	10.0
Golden Chinquapin Management Plan	0	0	0	1	5.0
Golden Chinquapin Survey	0	0	0	3	5.0
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>65</b>	<b>248.0</b>
<b>Hood Canal/Quilcene Ranger Districts</b>					
Peregrine Falcon Cliff Survey	0	0	0	10	6.2
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>6.2</b>
<b>Quilcene Ranger District</b>					
Spotted Owl R6 Monitoring	0	0	0	10	25.0
Spotted Owl Surveys	0	0	0	3	6.0
Marbled Murrelet Surveys	0	0	0	1	15.0
Bald Eagle Winter Surveys	0	0	0	1	5.0
Sensitive Plant Surveys	0	0	0	5	10.0
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>61.0</b>
<b>Quinault Ranger District</b>					
Marbled Murrelet Survey	0	0	0	0	0.0
Spotted Owl Survey	0	0	0	0	0.0
Bald Eagle/Osprey Nest Survey	0	0	0	0	0.0
Bald Eagle Communal Roost Survey	0	0	0	0	0.0
Bald Eagle Management Plan	0	0	0	0	1.0
Sensitive Plant Survey	0	0	0	0	0.0
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1.0</b>
<b>Soleduck Ranger District</b>					
Spotted Owl Survey	0	0	0	0	25.0
Marbled Murrelet Inventory	0	0	0	0	10.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
Sensitive Plant Survey	0	0	0	0	15.0
Spotted Owl Habitat Typing	0	0	0	0	20.0
Spotted Owl Prey District Study	0	0	0	0	10.0
Eagle Platforms – KV	0	2	0	0	2.0
Monitoring & Maintenance	0	0	0	0	2.0
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>84.0</b>
<b>FISCAL YEAR TOTAL</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>95</b>	<b>400.0</b>

FISCAL YEAR 1993

**Hood Canal Ranger District**

Bald Eagle Monitoring	0	0	0	6	4.5
Bald Eagle Management Plan	0	0	0	1	5.0
Spotted Owl Monitoring	0	0	0	12	65.5
Spotted Owl Habitat Rating/Catalog	0	0	0	1	6.0
Spotted Owl Banding Program	0	0	0	1	10.0
Spotted Owl Habitat Improvement	200	0	0	0	30.0
SOHA Management Plan	0	0	0	0	30.0
Marbled Murrelet Survey	0	0	0	3	45.5
Sensitive Salamander Inventory	0	0	0	4	6.5
Sensitive Bat Inventory	0	0	0	3	5.0
PETS Species Nest Structure (Wildlife)	0	0	0	10	15.5
PETS Species Survey (Area #3)	0	0	0	1	10.0
PETS Species Survey (Area #4)	0	0	0	1	10.0
PETS Species Management Plan (Area #2)	0	0	0	1	10.0
<b>DISTRICT TOTAL</b>	<b>200</b>	<b>0</b>	<b>0</b>	<b>44</b>	<b>253.0</b>

**Hood Canal/Quilcene Ranger Districts**

Peregrine Falcon Cliff Survey	0	0	0	10	6.2
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>6.2</b>

**Quilcene Ranger District**

Spotted Owl IRS Monitoring	0	0	0	10	25.0
Spotted Owl Reproduction Surveys	0	0	0	3	6.0
Marbled Murrelet Surveys	0	0	0	1	15.0
Bald Eagle Winter Surveys	0	0	0	1	5.0
Bald Eagle Breed Surveys	0	0	0	1	5.0
Sensitive Plant Surveys	0	0	0	5	10.0
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>66.0</b>

**Quinault Ranger District**

Marbled Murrelet Survey	0	0	0	0	0.0
Spotted Owl Survey	0	0	0	0	0.0
Bald Eagle/Osprey Nest Survey	0	0	0	0	0.0
Bald Eagle Communal Roost Survey	0	0	0	0	0.0
Sensitive Plant Survey	0	0	0	0	0.0
<b>DISTRICT TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>Soleduck Ranger District</b>					
Spotted Owl Survey	0	0	0	0	25.0
Marbled Murrelet Survey	0	0	0	0	10.0
Sensitive Plant Survey	0	0	0	0	15.0
Spotted Owl Habitat Typing	0	0	0	0	20.0
Spotted Owl Prey District Study	0	0	0	0	10.0
Monitoring & Maintenance	0	0	0	0	3.0
DISTRICT TOTAL	0	0	0	0	83.0
FISCAL YEAR TOTAL	200	0	0	75	408.2
FISCAL YEAR 1994					
<b>Hood Canal Ranger District</b>					
Bald Eagle Monitoring	0	0	0	6	4.5
Bald Eagle Management Plan	0	0	0	1	5.0
Spotted Owl Monitoring	0	0	0	12	65.5
Spotted Owl Habitat Rating/Catalog	0	0	0	1	8.0
Spotted Owl Banding Program	0	0	0	1	10.0
SOHA Management Plan	0	0	0	0	30.0
Marbled Murrelet Survey	0	0	0	3	45.5
Sensitive Salamander Inventory	0	0	0	4	6.5
Sensitive Bat Inventory	0	0	0	3	5.0
PETS Species Nest Structure (Wildlife)	0	0	0	10	15.5
PETS Species Survey (Area #5)	0	0	0	1	10.0
PETS Species Survey (Area #6)	0	0	0	1	10.0
PETS Species Management Plan (Area #3)	0	0	0	1	10.0
PETS Species Management Plan (Area #4)	0	0	0	1	10.0
DISTRICT TOTAL	0	0	0	45	233.0
<b>Hood Canal/Quilcene Ranger Districts</b>					
Peregrine Falcon Cliff Survey	0	0	0	1	8.2
DISTRICT TOTAL	0	0	0	1	8.2
<b>Quilcene Ranger District</b>					
Spotted Owl R6 Monitoring	0	0	0	10	25.0
Spotted Owl Reproduction Surveys	0	0	0	3	6.0
Marbled Murrelet Surveys	0	0	0	1	15.0
Bald Eagle Winter Surveys	0	0	0	1	5.0
Sensitive Plant Surveys	0	0	0	5	10.0
DISTRICT TOTAL	0	0	0	20	61.0
<b>Quinault Ranger District</b>					
Marbled Murrelet Survey	0	0	0	0	0.0
Spotted Owl Survey	0	0	0	0	0.0
Bald Eagle/Osprey Nest Survey	0	0	0	0	0.0
Bald Eagle Communal Roost Survey	0	0	0	0	0.0
Sensitive Plant Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	0.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
<b>Soleduck Ranger District</b>					
Spotted Owl Survey	0	0	0	0	25.0
Marbled Murrelet Inventory	0	0	0	0	10.0
Sensitive Plant Survey	0	0	0	0	15.0
Spotted Owl Habitat Typing	0	0	0	0	20.0
Monitoring & Maintenance	0	0	0	0	3.5
DISTRICT TOTAL	0	0	0	0	73.5
FISCAL YEAR TOTAL	0	0	0	66	375.7
FISCAL YEAR 1995					
<b>Hood Canal Ranger District</b>					
Bald Eagle Monitoring	0	0	0	6	4.5
Spotted Owl Monitoring	0	0	0	12	65.5
Spotted Owl Habitat Rating/Catalog	0	0	0	1	6.0
Spotted Owl Banding Program	0	0	0	1	10.0
SOHA Management Plan	0	0	0	0	30.0
Marbled Murrelet Survey	0	0	0	3	45.5
Sensitive Salamander Inventory	0	0	0	4	6.5
Sensitive Salamander Management Plan	0	0	0	4	6.5
Sensitive Bat Inventory	0	0	0	3	5.0
Sensitive Bat Management Plan	0	0	0	1	5.0
PETS Species Nest Structure (Wildlife)	0	0	0	10	15.5
PETS Species Survey (Area #7)	0	0	0	1	10.0
PETS Species Survey (Area #8)	0	0	0	1	10.0
PETS Species Management Plan (Area #5)	0	0	0	0	10.0
PETS Species Management Plan (Area #6)	0	0	0	0	10.0
DISTRICT TOTAL	0	0	0	47	239.5
<b>Quilcene Ranger District</b>					
Spotted Owl R6 Monitoring	0	0	0	10	25.0
Spotted Owl Reproduction Surveys	0	0	0	3	6.0
Marbled Murrelet Surveys	0	0	0	1	15.0
Bald Eagle Winter Surveys	0	0	0	1	5.0
Sensitive Plant Surveys	0	0	0	5	10.0
DISTRICT TOTAL	0	0	0	20	61.0
<b>Quinault Ranger District</b>					
Marbled Murrelet Survey	0	0	0	0	0.0
Spotted Owl Survey	0	0	0	0	0.0
Bald Eagle/Osprey Nest Survey	0	0	0	0	0.0
Bald Eagle Communal Roost Survey	0	0	0	0	0.0
Marbled Murrelet Plan/Data Base	0	0	0	0	1.0
Sensitive Plant Survey	0	0	0	0	1.0
DISTRICT TOTAL	0	0	0	0	2.0
<b>Soleduck Ranger District</b>					
Spotted Owl Survey	0	0	0	0	25.0
Marbled Murrelet Inventory	0	0	0	0	10.0
Sensitive Plant Survey	0	0	0	0	15.0
Spotted Owl Habitat Typing	0	0	0	0	20.0
Monitoring & Maintenance	0	0	0	0	4.0
DISTRICT TOAL	0	0	0	0	74.0
FISCAL YEAR TOTAL	0	0	0	67	376.5
GRANDTOTAL	200	5	0	395	1,957.8

## SILVICULTURE ACTIVITIES

Project Name	Unit	Number of Units	Costs (thousands of dollars)
FISCAL YEAR 1991			
Silvicultural Exams	Acre	30,000	450
Sustained Yield Units - Admin	SYU	2	70
Precommercial Thinning	Acre	1,700	325
Aerial Feitlllization	Acre	2,000	160
Reforestation (Appropriated Funds)	Acre	450	180
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200
FISCAL YEAR 1992			
Silvicultural Exams	Acre	30,000	450
Sustained Yield Units - Administration	SYU	2	70
Precommercial Thinning	Acre	1,800	342
Aerial Fertilization	Acre	2,000	160
Reforestation (Appropriated Funds)	Acre	350	140
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200
FISCAL YEAR 1993			
Silvicultural Exams	Acre	30,000	450
Sustained Yield Units - Administration	SYU	2	70
Precommercial Thinning	Acre	1,800	342
Aerial Fertilization	Acre	2,000	160
Release and Weeding	Acre	360	58
Reforestation (Appropriated Funds)	Acre	275	110
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200
FISCAL YEAR 1994			
Silvicultural Exams	Acre	30,000	450
Sustained Yield Units - Administration	SYU	2	70
Precommercial Thinning	Acre	1,800	342
Aerial Fertilization	Acre	2,000	160
Release and Weeding	Acre	360	58
Reforestation (Appropriated Funds)	Acre	225	95
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200
FISCAL YEAR 1995			
Silvicultural Exams	Acre	30,000	450
Sustained Yield Units - Administration	SW	2	70
Precommercial Thinning	Acre	2,000	380
Aerial Fertilization	Acre	2,000	160
Release and Weeding	Acre	360	95
Reforestation (Appropriated Funds)	Acre	225	95
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200
FISCAL YEAR 1996			
Silvicultural Exams	Acre	30,000	450
SW Administration - Revised SCSYU Plan	SW	2	170
Precommercial Thinning	Acre	2,000	380
Aerial Fertilization	Acre	2,000	160
Release and Weeding	Acre	360	95
Reforestation (Appropriated Funds)	Acre	225	95
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200

## SOIL AND WATER

Project Name	Unit	Number of Units	Costs (thousands of dollars)
FISCAL YEAR 1991			
<b>All Ranger Districts</b>			
Water Quality and Cumulative Effects Monitoring	Each	60	163.0
Riparian Area Monitoring	Each	8	20.0
<b>Hood Canal Ranger District</b>			
Slope Failure Inventory (Shaffer, Grisdale, Harris IRAA)	Acre	10,000	6.0
Watershed Resource Planning	Plan	1	5.0
Watershed Improvement Construction (Shaffer, and Grisdale IRAA)	Acre	200	200.0
Watershed improvement Maintenance	Acre	25	25.0
<b>Quilcene Ranger District</b>			
Slope Stabilization Planting	Acre	5	2.5
Sluice-out Stabilization Planting	Acre	5	3.0
Miller Seeder	Acre	20	2.3
Hand Seeding	Acre	20	5.0
Slope Failure Inventory	M Acre	14	7.0
Gold Creek Slide Plan and Work	Acre	4	20.0
<b>Quinault Ranger District</b>			
Watershed improvement Inventory	M Acre	50	20.0
Watershed Resource Planning	M Acre	50	5.0
Watershed Improvement Maintenance	Each	10	5.0
Upper Quinault Study	Each	1	3.0
Aerial Seeding	Acre	25	4.0
Sidecast Pullback	Cubic Yards	4,000	40.0
Aerial Hydra Mulching	Acre	50	20.0
<b>Soleduck Ranger District</b>			
Sidecast Removal	Cubic Yards	450	45.0
Sidecast Removal FY92 Plan	Plan	1	5.0
Deadman Hill Slope Stabilization	Acre	100	45.0
Klahanie River Bank Protection	Feet	400	20.0
Klahowya River Bank Protection	Feet	500	30.0
Pistol Creek Slope Stabilization	Acre	250	100.0
S Fork Soleduck Slope Stabilization Plan	Plan	1	10.0
Snider Creek Bank Stabilization	Feet	400	20.0
Snider Ridge Area Rehabilitation	Acre	250	100.0
YEAR TOTAL			930.8
FISCAL YEAR 1992			
<b>All Ranger Districts</b>			
Water Quality & Cumulative Effects Monitoring	Each	60	121.0
Riparian Area Monitoring	Each	8	20.0
<b>Hood Canal Ranger District</b>			
Slope Failure Inventory (Harris & Cedar IRAA)	Acre	10,000	8.0
Watershed Resource Planning	Plan	1	5.0
Watershed improvement Construction (Harris IRAA)	Acre	200	200.0
Watershed Improvement Maintenance	Acre	25	25.0

Project Name	Unit	Number of Units	Costs (thousands of dollars)
<b>Quilcene Ranger District</b>			
Slope Stabilization Planting	Acre	5	3.1
Sluice-out Stabilization Planting	Acre	20	2.4
Miller Seeder	Acre	10	2.6
Hand Seeding	Acre	14	7.3
Slope Failure Inventory	M Acre	5	8.3
Watershed Improvement Construction			
<b>Quinault Ranger District</b>			
Watershed Improvement Inventory	M Acre	50	20.0
Watershed Resource Planning	M Acre	50	5.0
Watershed Resource Administration	M Acre	140	10.0
Watershed Improvement Maintenance	Each	12	6.0
Upper Quinault Study	Each	1	3.0
Aerial Seeding	Acre	50	10.0
Sidecast Pullback	Cubic Yards	4,000	40.0
Aerial Hydro Mulch	Acre	50	20.0
Compaction Inventory	Acre	2,000	10.0
Hydrology (Qualitative/Quantitative) inventory	Acre	50,000	10.0
<b>Soleduck Ranger District</b>			
Sidecast Removal	Cubic Yards	450	45.0
Sidecast Removal FY93 Plan	Plan	1	5.0
N Fork Sitkum Area Rehabilitation Plan	Plan	1	20.0
S Fork Soleduck Slope Stratification	Acre	40	15.0
YEAR TOTAL			622.3
FISCAL YEAR 1993			
<b>All Ranger Districts</b>			
Water Quality & Cumulative Effects Monitoring	Each	60	121.0
Riparian Area Monitoring	Each	8	20.0
<b>Hood Canal Ranger District</b>			
Slope Failure Inventory (Cedar & Canyon IRAA)	Acre	10,000	6.0
Watershed Resource Planning	Plan	1	5.0
Watershed Improvement Construction (Cedar IRAA)	Acre	200	200.0
<b>Quilcene Ranger District</b>			
Slope Stabilization Planting	Acre	5	2.7
Sluice-out Stabilization Planting	Acre	5	3.2
Miller Seeder	Acre	20	2.5
Hand Seeding	Acre	10	2.7
Slope Failure Inventory	M Acre	14	7.6
Watershed Improvement Construction	Project	10	16.6
<b>Quinault Ranger District</b>			
Watershed Improvement Inventory	M Acre	40	20.0
Watershed Resource Planning	M Acre	40	5.0
Watershed Resource Administration	M Acre	150	10.0
Watershed Improvement Maintenance	Each	14	7.0
Upper Quinault Study	Each	1	3.0
Aerial Seeding	Acre	50	8.0
Sidecast Pullback	Cubic Yards	5,000	40.0
Aerial Hydro Mulching	Acre	60	20.0
Compaction Inventory	Acre	2,000	10.0
Hydrology (Qualitative/Quantitative) Inventory	Acre	50,000	10.0

Project Name	Unit	Number of Units	Costs (thousands of dollars)
<b>Soleduck Ranger District</b>			
Sidecast Removal	Cubic Yards	450	45.0
Sidecast Removal FY 94 Plan	Plan	1	5.0
Goodman Creek Area Rehabilitation Plan	Plan	1	10.0
N Fork Sitkum Area Rehabilitation	Acre	350	150.0
YEAR TOTAL			709.3
FISCAL YEAR 1994			
<b>All Ranger Districts</b>			
Water Quality & Cumulative Effects Monitoring	Each	60	121.0
Riparian Area Monitoring	Each	8	20.0
<b>Hood Canal Ranger District</b>			
Slope Failure Inventory (Canyon IRAA)	Acre	10,000	6.0
Watershed Resource Planning	Plan	1	5.0
Watershed Improvement Construction (Canyon IRAA)	Acre	200	200.0
Watershed Improvement Maintenance	Acre	25	25.0
<b>Quilcene Ranger District</b>			
Slope Stabilization Planting	Acre	5	2.8
Sluice-out Stabilization Planting	Acre	5	3.4
Miller Seeder	Acre	20	2.6
Hand Seeding	Acre	10	2.6
Slope Failure Inventory	MAcre	14	7.9
Gold Creek Slide Planning	Plan	1	5.6
Watershed Improvement Construction	Project	15	25.0
Gold Creek Slope Stabilization	Structure	1	75.0
<b>Quinault Ranger District</b>			
Watershed Resource Planning	MAcro	40	5.0
Watershed Resource Administration	M Acre	150	10.0
Watershed Improvement Maintenance	Each	20	10.0
Upper Quinault Study	Each	1	3.0
Aerial Seeding	Each	50	8.0
Sidecast Pullback	Cubic Yard	5,000	40.0
Aerial Hydro Mulch	Acre	100	20.0
Compaction Inventory	Acre	2,000	10.0
Hydrology (Qualitative/Quantitative) Inventory	Acre	40,000	9.0
<b>Soleduck Ranger District</b>			
Sidecast Removal	Cubic Yard	450	45.0
Sidecast Removal FY95 Plan	Plan	1	5.0
Goodman Creek Area Rehabilitation	Acre	150	60.0
Hyas Creek Area Rehabilitation Plan	Plan	1	10.0
YEAR TOTAL			716.1
FISCAL YEAR 1995			
<b>All Ranger Districts</b>			
Water Quality & Cumulative Effects Monitoring	Each	60	100.0
Riparian Area Monitoring	Each	8	20.0

Project Name	Unit	Measure	Thousands of Dollars
<b>Hood Canal Ranger District</b>			
Slope Failure Inventory (Neby IRAA)	Acre	15,000	8.0
Watershed Resource Planning	Plan	1	5.0
Watershed Improvement Construction (Canyon & Neby BAA)	Acre	200	200.0
Watershed improvement Maintenance	Acre	25	25.0
<b>Quilcene Ranger District</b>			
Slope Stabilization Planting	Acre	5	2.9
Sluice-out Stabilization Planting	Acre	5	3.5
Miller Seeder	Acre	20	2.7
Hand Seeding	Acre	10	2.9
Slope Failure Inventory	M Acre	14	8.2
Watershed Improvement Construction	Project	15	25.0
<b>Quinalt Ranger District</b>			
Watershed Resource Planning	M Acre	40	5.0
Watershed Resource Administration	M Acre	150	10.0
Watershed Improvement Maintenance	Each	20	10.0
Upper Quinalt Study	Each	1	3.0
Aerial Seeding	Acre	100	16.0
Sidecast Pullback	Cubic Yards	5,000	40.0
Aerial Hydro Mulch	Acre	100	20.0
Compaction Inventory	Acre	2,000	10.0
<b>Soleduck Ranger District</b>			
Sadecast Removal	Cubic Yards	450	45.0
Sidecast Removal FY96 Plan	Plan	1	5.0
Hyas Creek Area Rehabilitation	Acre	100	45.0
YEAR TOTAL			633.2

**ROAD AND BRIDGE CAPITAL INVESTMENTS**  
**(Unit of Measure - Miles)**

Project Name	Road Number	Unit	Thousands of Dollars	Road
<b>FISCAL YEAR 1990</b>				
Dosewallips Roads	2160	6.5	173.0	2
Forest Small Projects	Various	0.1	100.0	1-5
<b>YEAR TOTAL</b>		<b>6.6</b>	<b>273.0</b>	
<b>FISCAL YEAR 1991</b>				
Sadie Creek Culvert	3040	0.1	65.0	5
W Snider/Pole Patch Preroad	3040	4.0	200.0	5
Dungeness Road	2860	11.3	370.0	2
Fish Mitigation	Various	50.0	50.0	1
Cabin Creek Bridge	25		150.0	1
Forest Small Projects	Various		100.0	1-5
<b>YEAR TOTAL</b>		<b>15.4</b>	<b>935.0</b>	
<b>FISCAL YEAR 1992</b>				
Forest Small Projects	Various		100.0	1-5
Camp Grisdale Road	22	17.0	2,600.0	1
Rugged Ridge		3.3	825.0	5
Hamma Hamma Pave	25	1.5	200.0	1
Road 30-3 88 Culvert	30		21.0	5
Fish Mitigation	Various		50.0	1
Big Creek Camp Grisdale Expansion Roads		1.4	120.0	1
<b>YEAR TOTAL</b>		<b>23.2</b>	<b>3,196.0</b>	
<b>FISCAL YEAR 1993</b>				
Hamma Hamma Reconstruction	25	5.7	765.0	1
Quilcene Bridge Replacement	2,860		270.0	2
Little River Bridge	3030-02		175.0	5
Fish Mitigation	Various		50.0	1
Cedar Flats	2,847		250.0	2
Forest Small Projects	Various	3.0	100.0	1-5
<b>YEAR TOTAL</b>		<b>8.7</b>	<b>1,610.0</b>	
<b>FISCAL YEAR 1994</b>				
Sitkum-Soleduck	29	9.2	1,200.0	5
Road 22 Reconstruction	22	5.0	800.0	3
Fish Mitigation	Various		50.0	1
Administration Site Paving	2272-130	1.0	75.0	3
Forest Small Projects	Various		100.0	1-5
Rainforest Camp Grisdale Roads		0.7	300.0	3
<b>YEAR TOTAL</b>		<b>15.9</b>	<b>2,525.0</b>	

Project Name	Road Number	Unit	Thousands of Dollars	Road
<b>FISCAL YEAR 1995</b>				
Donohue Bridge	2920-22		130.0	5
Road 30 Structures	30		200.0	5
Rockline Reconstruction	2204	4.8	500.0	3
Road 23 Reconstruction	23	2.7	650.0	1
Road 24 Reconstruction	24	4.0	500.0	1
Forest Small Project	Various		100.0	1-5
Oxbow Camp Grisdale Roads		1.3	170.0	1
<b>YEAR TOTAL</b>		<b>12.8</b>	<b>2,250.0</b>	

## **BUILDINGS, WATER, AND SEWER CAPITAL INVESTMENTS**

Project Name	Thousands of Dollars
<b>FISCAL YEAR 1991</b>	
<b>Quinalt Ranger District</b>	
Falls Creek WC Barracks	250.0
Falls Creek WC Shop/Equipment Storage	490.0
Falls Creek WC Warehouse & Flammable Storage	600.0
<b>FISCAL YEAR 1992</b>	
<b>Quinalt Ranger District</b>	
Inlet Tank at Quinalt Sewer Treatment Plant	110.0
Expand Sewer Treatment Plant & Drainfield	200.0
New Waterline along South Shore Road	30.0
<b>FISCAL YEAR 1993</b>	
<b>Soleduck Ranger District</b>	
Purchase Soleduck Office Wellness Building	1000.0
	75.0
<b>FISCAL YEAR 1994</b>	
<b>Soleduck Ranger District</b>	
Snider WC Shop/Equipment Storage	490.0
Snider WC Bunkhouses	500.0
<b>FISCAL YEAR 1995</b>	
<b>Soleduck Ranger District</b>	
Soleduck Ranger District Warehouse	330.0
<b>Quilcene Ranger District</b>	
Quilcene Shop/Warehouse	450.0
Quilcene Office Expansion	50.0
Quilcene Barracks	100.0

### **SPECIAL USE ADMINISTRATION**

Project Name/Type	Unit of Measure	Number of Units	Costs (Thou sands of Dollars)
FIRST 5 YEARS, 1991-1995			
<b>All Ranger Districts</b>	Cases	1,250	325.0
SECOND 5 YEARS, 1996-2000			
<b>All Ranger Districts</b>	Cases	1,500	400.0

### **LAND EXCHANGE**

Project Name/Type	Unit of Measure	Number of Units	Costs (Thou sands of Dollars)
FIRST 5 YEARS, 1991-1995			
<b>All Ranger Districts</b>			
Various Owners Private Land	M Acres	230	80.0
SECOND 5 YEARS, 1996-2000			
<b>All Ranger Districts</b>			
Various Owners Private Land	M Acres	20	40.0

### **RIGHTS OF WAY ACQUISITION**

Project Name/Type	Unit of Measure	Number of Units	Costs (Thou sands of Dollars)
FIRST 5 YEARS, 1921 -1995			
<b>All Ranger Districts</b>	Cases	10	75.0
SECOND 5 YEARS, 1996-2000			
<b>All Ranger Districts</b>	Cases	10	95.0

## LAND LINE LOCATION

Project Name/Type	Unit of Measure	Number of Units	Costs (Thousands of Dollars)
FIRST 5 YEARS, 1991-1995			
<b>All Ranger Districts</b>	Miles	100	900.0
SECOND 5 YEARS, 1996-2000			
<b>All Ranger Districts</b>	Miles	125	1,100.0

## MINERALS MANAGEMENT

Project Name/Type	Unit of Measure	Number of Units	Costs (Thousands of Dollars)
FIRST 5 YEARS, 1991-1995			
<b>All Ranger Districts</b>	Cases	100	65.0
SECOND 5 YEARS, 1996-2000			
<b>All Ranger Districts</b>	Cases	150	75.0

# Appendix B

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## Monitoring Worksheets



Olympic National Forest

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# APPENDIX B

## MONITORING WORKSHEETS

### INTRODUCTION

This appendix contains the monitoring worksheets which served as the basis for development of the monitoring plan outlined in Chapter V of this Forest Plan. Each worksheet presents, for each of the monitoring topics evaluated, the details of the 13-step process used to identify monitoring needs and generate a monitoring plan. This process is described in Chapter V. The definitions and explanations of the 13 individual steps are repeated here, in order to facilitate understanding of the worksheets which follow.

1. **MONITORING TOPIC:** These relate to the public issues, management concerns and resource management opportunities (ICOs) the Forest Plan was designed to address. A full discussion of the ICOs can be found in Chapter I and Appendix A of the FEIS. They are also summarized in Chapter I of this document. In addition to the monitoring topics identified that respond to ICOs, other topics have been added to ensure complete monitoring coverage.
2. **THRESHOLD OF VARIABILITY:** This is the variation from the expected outputs, or activities, that is permitted before corrective action or further evaluation is necessary.
3. **MONITORING QUESTIONS:** These questions are the core of the intent for monitoring. The essence of each question is, "Are things going as the Forest Plan intended?" Information is generally included in the question to indicate the variance from the target quantity which is acceptable. Information to answer these will be obtained and analyzed using valid statistical procedures.
4. **SUGGESTED METHODS/INFORMATION SOURCES:** For each monitoring question, methods and/or sources of information are suggested. The purpose of this section is only to suggest reasonable methods or sources of information. It is not intended to exclude other methods as long as information will respond to the questions at a reasonable cost.

For single resource monitoring activities, the person responsible for the monitoring activity will determine which technique is best at the time of data gathering. Data will be collected in a manner that ensures meeting statistical parameters suggested by the monitoring questions. For interdisciplinary reviews, the Forest Supervisor will select team members who represent appropriate resources, considering the monitoring question(s) involved. A team leader will be designated. This person will be responsible for preparing and submitting a report of the findings of the monitoring activity.

5. **UNIT OF MEASURE:** This is a quantifiable measure of the output, action or effect being monitored.
6. **MONITORING FREQUENCY:** For each monitoring question, the frequency with which it must be addressed is indicated. A report will be prepared by the person responsible for the monitoring activity. The report will be submitted to a Monitoring Coordinator, who will summarize findings from all reports due that reporting period (usually a year). This summary report will be submitted

## INTRODUCTION

to the Forest Supervisor. Copies of the summary report, and of the individual reports, will be kept on file at the Forest headquarters. The summary report may also be distributed to other interested agencies and the public.

- 7. PRECISION AND RELIABILITY:** This indicates the validity and exactness with which monitoring data are to be collected. Precision is the exactness or accuracy of measurement. Reliability is the expected probability that information acquired through sampling will reflect actual conditions. Precision and reliability are rated as follows:

High - Maximum variation within 10 percent of sample mean.

Moderate - Maximum variation within 33 percent of sample mean.

Low - Maximum variation within 50 percent of sample mean.

- 8. DATA STORAGE:** This is where collected monitoring data, analyses and evaluation reports for the monitoring question are stored. The information will be stored for the duration of the Forest Plan.
- 9. REPORTS DUE:** This is the date by which reports responding to monitoring questions must be submitted. Suggested possible causes for unfavorable reports are listed. Unfavorable reports are those which indicate that actual conditions are outside expected results of the Forest Plan.
- 10. COST:** Costs are estimated and shown as an annual cost for all monitoring activities associated with each monitoring question. When work or reports are not done on an annual basis, costs shown are the average annual cost over a ten-year period. Included in parentheses are the year and expected cost for the actual monitoring activity. Example: "\$1,000 (year 5, \$5,000 and year 10, \$5,000)" means a total annual cost of \$1,000, but \$5,000 will be needed in years of the plan period and another \$5,000 in year 10.

The component of total annual cost currently included in normal operating costs (if any) is shown in parentheses. Ex: \$3,000 (\$2,000) means a total annual cost of \$3,000 of which \$2,000 is currently included in the Forest's operating budget.

- 11. RESPONSIBILITY:** The person responsible for responding to the monitoring question.
- 12. RESEARCH NEEDS:** Indicates additional research is needed to aid in fully responding to the monitoring question.
- 13. INVENTORY NEEDS:** Indicates additional data is needed to fully respond to the monitoring question.

## INDIVIDUAL MONITORING WORKSHEETS

The worksheets for the monitoring topics upon which the Forest's monitoring plan is based, are presented in the following pages.

**MONITORING TOPIC: Semi-Primitive and Primitive Recreation**

The goal is to provide a variety of undeveloped recreation opportunities in areas characterized by a predominantly natural or natural-appearing environment in which the criteria for Semi-Primitive or Primitive settings are met (applies to areas outside of Wilderness).

**THRESHOLD OF VARIABILITY:**

When the desired physical, social and managerial setting criteria for Primitive or Semi-Primitive ROS classes are not being met, or acres are reduced within an area that is allocated to Underdeveloped Recreation (Motorized) or Underdeveloped Recreation (Non-Motorized).

**MONITORING QUESTION:**

Are the areas allocated to Semi-Primitive and Primitive use providing Semi-Primitive and Primitive opportunities?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Field review involving visitor contacts and observation of resource conditions. Inventory use levels with trail registers and field counts.

**UNIT OF MEASURE:**

Acres by ROS class and ROS criteria. Recreation Visitors Days of use per acre and number of visitor encounters.

**MONITORING FREQUENCY:**

Annually.

**PRECISION AND RELIABILITY:**

Moderate to high

**DATA STORAGE:**

Inventory cards and Recreation Information Management system, (RIM).

**REPORTS DUE:**

Recreation Information Management RVD Report, annually.

*SEMI-PRIMITIVE AND PRIMITIVE RECREATION*

**COSTS:**

\$5,000

**RESPONSIBILITY:**

Recreation Staff

**RESEARCH NEEDS:**

Research recreation use by activity, site/area, and ROS classes and develop a reliable method for determining RVDs for undeveloped recreation.

**INVENTORY NEEDS:**

Inventory undeveloped campsites and record data. Implement the Limits of Acceptable Change process in high use areas.

**MONITORING TOPIC: Trails**

The goal is to provide a range of trail user opportunities in a variety of Recreational Opportunity Spectrum classes that meet trail management objectives and demand, and avoid conflicts between different types of users.

**THRESHOLD OF VARIABILITY:**

Zero cases with documented incidents of user conflicts or resource damage, I e., no cases are permitted before corrective action or further evaluation is necessary.

**MONITORING QUESTION:**

Are trail management objectives and demand being met? Are there any conflicts between user types?

**SUGGESTED METHOD/INFORMATION SOURCES:**

Field review and trail registers. Written public comments concerning conflicts

**UNIT OF MEASURE:**

Documented or written notification of user conflicts or resource damage.

**MONITORING FREQUENCY:**

Annually.

**PRECISION AND RELIABILITY:**

High.

**DATA STORAGE:**

Recreation Information Management (RIM) system, trail registers and RIM\_TRIS database. District and 8.0. 2300 Files.

**REPORTS DUE:**

Recreation Information Management RVD Report, annually.

*TRAILS*

**COSTS:**

\$10,000.

**RESPONSIBILITY:**

Recreation Staff.

**RESEARCH NEEDS:**

Research the different types of trail use (hiker, stock, mountain bicycles, motorbikes, etc.) to determine if and how they affect one another.

**INVENTORY NEEDS:**

None needed.

**MONITORING TOPIC: Scenery**

The goal is to manage specific landscapes in such a manner that their scenic values are protected, maintained, and/or enhanced as viewed from major travel routes, use areas, or water bodies.

**THRESHOLD OF VARIABILITY:**

When more than 10 percent of acres in a given management area are not in compliance with the Visual Quality Objectives of Retention and Partial Retention.

**MONITORING QUESTION:**

Are Visual Quality Objectives being met?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Field reviews, camera points, and visual analysis.

**UNIT OF MEASURE:**

Acres by VQO (Retention and Partial Retention).

**MONITORING FREQUENCY:**

Annually.

**PRECISION AND RELIABILITY:**

High.

**DATA STORAGE:**

District and S O 2300 files.

**REPORTS DUE:**

Three year intervals.

**COSTS:**

\$8,000.

*SCENERY*

**RESPONSIBILITY:**

Recreation Staff.

**RESEARCH NEEDS:**

Research how Forest visitors perceive the various Forest resource management activities and their visual impacts upon scenery.

**INVENTORY NEEDS:**

Inventory Forest travel routes and use areas to determine if current use warrant a change in the visitor sensitivity levels.

**MONITORING TOPIC: Developed Recreation Sites**

The goal is to provide readily accessible, appropriately designed and maintained facilities that will meet demand for concentrated use by people seeking a convenient recreational experience. Management is aimed at providing a range of activities involving developed opportunities along the Recreation Opportunity Spectrum.

**THRESHOLD OF VARIABILITY:**

Use is less than 40 percent of Theoretical Capacity, i.e., when use *exceeds* 40 percent corrective action or further evaluation is necessary.

**MONITORING QUESTION:**

Are sites consistently receiving heavy use approaching or exceeding Theoretical Capacity?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Estimate use at sites by random sample counts and counting fee envelopes.

**UNIT OF MEASURE:**

Recreation Visitor Days of use.

**MONITORING FREQUENCY:**

Annually.

**PRECISION AND RELIABILITY:**

High.

**DATA STORAGE:**

Recreation Information Management system (RIM).

**REPORTS DUE:**

Recreation Information Management RVD Report, annually.

*DEVELOPED RECREATION SITES*

**COSTS:**

\$10,000

**RESPONSIBILITY:**

Recreation Staff.

**RESEARCH NEEDS:**

None needed.

**INVENTORY NEEDS:**

None needed.

**MONITORING TOPIC: Wilderness**

The goal is to preserve and protect in perpetuity the primeval character and influence of the Wilderness by meeting the specific criteria for the resource, social and managerial conditions as identified through the Limits of Acceptable Change process.

**THRESHOLD OF VARIABILITY:**

When the minimum limits of acceptable change (LAC) for each Wilderness Resource Spectrum (WRS) class are maintained or a downward trend is not indicated, i.e., when LAC is *not* maintained or a downward trend *is* indicated, corrective action or further evaluation is necessary.

Change that is equal to or less than defined limits and indicators of units.

**MONITORING QUESTIONS:**

Are the Limits of Acceptable Change being met?

**SUGGESTED METHOD/INFORMATION SOURCES:**

Field review.

**UNIT OF MEASURE:**

The indicators identified through the Limits of Acceptable Change process.

**MONITORING FREQUENCY:**

Annually.

**PRECISION AND RELIABILITY:**

High.

**DATA STORAGE:**

Inventory plots, camera points and District 2300 files.

**REPORTS DUE:**

Annually at the end of the recreation use season a list of areas where limits of acceptable change indicators are being exceeded or moving towards being exceeded will be documented.

*WILDERNESS*

**COSTS:**

\$10,000

**RESPONSIBILITY:**

Recreation Staff.

**RESEARCH NEEDS:**

Research and develop a computerized method for managing campsite inventory data.

**INVENTORY NEEDS:**

Inventory and record LAC indicator data.

**MONITORING TOPIC: Off-Road Vehicles (ORV)**

The goal is to provide off-road vehicle opportunities to meet demand that will not cause considerable adverse effects on soil, water, fish, wildlife, cultural historic resources, and other trail users.

**THRESHOLD OF VARIABILITY:**

A significant number of recorded violations or conflicts on any trail where ORVs are not the primary management objective. A threshold evaluation will be made with every documented violation, user conflict incident, or incident of resource damage. Corrective action may result.

**MONITORING QUESTION:**

Are off-road vehicles causing or will cause considerable adverse effects on resources or other trail users on trails where ORVs are not the primary management objective?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Field reviews, camera points, notices of violation, and written public comments.

**UNIT OF MEASURE:**

Number and severity of violations, use conflicts and/or resource damage.

**MONITORING FREQUENCY:**

Annually.

**PRECISION AND RELIABILITY:**

Moderate.

**DATA STORAGE:**

District and Supervisor's Office - 2300 files.

**REPORTS DUE:**

Three year intervals.

*OFF-ROAD VEHICLES (ORV)*

**COSTS:**

\$8,000.

**RESPONSIBILITY:**

Recreation Staff and District Ranger.

**RESEARCH NEEDS:**

Research off-road vehicle (ORV) use in specific areas to determine if and how ORVs affect other visitors and resources.

**INVENTORY NEEDS:**

Inventory Limits of Acceptable Change indicators.

**MONITORING TOPIC: Wild and Scenic Rivers**

**THRESHOLD OF VARIABILITY:**

Identification of proposals or levels and types of uses that would result in the need to reclassify a designated river or segment to a lower classification or non-Wild and Scenic status.

Zero degradation of attributes needed to maintain classification integrity. i.e., *any* degradation of attributes will result in corrective action or further evaluation.

**MONITORING QUESTION:**

Are Wild and Scenic attributes of designated Wild and Scenic rivers or segments being maintained to meet the requirements of the Act?

**SUGGESTED METHODS/INFORMATION SOURCES:**

EA review of projects that might affect the river On-site observation of levels and types of uses occurring.

**UNIT OF MEASURE:**

Wild and Scenic River classification criteria

**MONITORING FREQUENCY:**

Each project proposed. Seasonal (minimum).

**PRECISION AND RELIABILITY:**

One hundred percent of all projects must be reviewed. Low intensity surveys are accepted.

**DATA STORAGE:**

District files with annual summary to S.O. files.

*WILD AND SCENIC RIVERS*

**REPORTS DUE:**

Each project EA. District - each report with annual summary to S.O.

**COST:**

\$500 per year for the three rivers proposed for Wild and Scenic designation in the Olympic National Forest Plan.

**RESPONSIBILITY:**

Quilcene Ranger District for project EA and field use surveys.

**RESEARCH NEEDS:**

Methods to sample use types and levels.

**INVENTORY NEEDS:**

Current levels of use by type.

**MONITORING TOPIC: Cultural Resources**

Cultural resources provide valuable links with the past. Discovery of these resources provides us with knowledge to manage and protect these irreplaceable resources.

**THRESHOLD OF VARIABILITY:**

Zero projects or cases without surveys and SHPO consultation, i.e., *any* projects or cases without surveys and SHPO consultation will result in corrective action or further evaluation.

**MONITORING QUESTION:**

Are cultural resource surveys being performed as required?

**SUGGESTED METHOD/INFORMATION SOURCES:**

Cultural resource reconnaissance, surveys and evaluations will be completed as described in the Region 6 “Cultural Resource Management Guidebook” for all project proposals and undertakings prior to implementing management decisions. Every ground disturbing project proposal or management activity that could impact cultural resources will be examined and documented with SHPO consultation as an integral part of the environmental analysis process.

**UNIT OF MEASURE:**

Numbers of projects and acres surveyed.

**MONITORING FREQUENCY:**

Forest officers authorized to approve NEPA documentation and compliance will certify that SHPO consultation is complete as part of approval processes. Annual accomplishment reports will also monitor survey and consultation processes.

**PRECISION AND RELIABILITY:**

High for both.

**DATA STORAGE:**

Case files, 2360 Site locations will be permanently documented in a sensitive subsystem of the Total Resource Information (TRI) system.

*CULTURAL RESOURCES*

**REPORTS DUE:**

Accomplishment reports will be prepared annually and kept in permanent records.

**COST:**

\$5,000.

**RESPONSIBILITY:**

Forest Recreation Staff Officer.

**RESEARCH NEEDS:**

A formal survey design strategy needs to be completed.

**INVENTORY NEEDS:**

There is a need to complete a Forest-wide inventory of all cultural resources.

**MONITORING TOPIC: Coordination with American Indians**

**THRESHOLD OF VARIABILITY:**

No incidents of conflict between Forest policy and American Indian rights and/or other concerns; ongoing contact between Forest Leadership Team member and Tribal leaders within zone of influence, i.e., if contact is not ongoing and/or incidents of conflict *are* reported, corrective action or further evaluation is necessary.

**MONITORING QUESTIONS:**

Are Tribal representatives and/or Religious Leaders informed about Forest programs and activities especially how these may relate to interests and concerns about the American Indian Religious Freedom Act and negotiated Treaties?

**SUGGESTED METHODS/INFORMATION SOURCES:**

NEPA documentation of project coordination for activities that occur adjacent to Reservation boundaries. Meetings, interviews, and telephone contacts. Cooperative management of employment programs or mutually benefiting activities. Field visits and sharing of annual programs of work.

**UNIT OF MEASURE:**

Documentation of contacts.

**MONITORING FREQUENCY:**

Annually at Forest Leadership Meetings.

**PRECISION AND RELIABILITY:**

Moderate and high.

**DATA STORAGE:**

Include documentation in 2360 case files on Annual Action Plans for American Indian Programs.

**REPORTS DUE:**

Annually.

*COORDINATION WITH AMERICAN INDIANS*

**COSTS:**

\$5,000.

**RESPONSIBILITY:**

Forest Leadership Team (FLT).

**RESEARCH NEEDS:**

None.

**INVENTORY NEEDS:**

None.

**MONITORING TOPIC: Cultural and Historical Site Protection**

**THRESHOLD OF VARIABILITY:**

No damage or loss to unevaluated or National Register eligible properties, i.e., *any* damage or loss will result in corrective action or further evaluation.

**MONITORING QUESTIONS:**

Are cultural resource properties (unevaluated or eligible for the National Register of Historic Places) being adequately protected from vandalism, natural degradation, etc.?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Field visits and visual observation of all significant and unevaluated sites for changed conditions. Photograph and inventory conditions and document in case file

**UNIT OF MEASURE:**

Sites.

**MONITORING FREQUENCY:**

Annually.

**PRECISION AND RELIABILITY:**

High for both.

**DATA STORAGE:**

Record in specific site case file.

**REPORTS DUE:**

In conjunction with annual accomplishment reports and PMOA with SHPO on Depression Era Activities.

*CULTURAL AND HISTORICAL SITE PROTECTION*

**COSTS:**

\$2,000.

**RESPONSIBILITY:**

Recreation Staff Office.

**RESEARCH NEEDS:**

Better maintenance cost data for unevaluated or eligible structures.

**INVENTORY NEEDS:**

Evaluations need to be compiled.

**MONITORING TOPIC: Cultural and Historic Site Rehabilitation**

**THRESHOLD OF VARIABILITY:**

Inspections are not performed and/or criteria that give the site or structure value are damaged or lost.

**MONITORING QUESTIONS:**

Are complete, preventative inspections and commensurate stabilization, repair, or rehabilitation projects scheduled and performed for sites or structures eligible for inclusion in the National Register of Historic Places?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Building maintenance and condition surveys and inspections using Secretary of Interior Standards and Guidelines for maintenance, repair, and rehabilitation of historic structures.

**UNIT OF MEASURE**

Compare conditions and proposed work to Secretary of Interior Guidelines for each structure.

**MONITORING FREQUENCY:**

In conjunction with schedules for building maintenance surveys, include annual visual inspection per significant sites.

**PRECISION AND RELIABILITY:**

High for both.

**DATA STORAGE:**

In general, building maintenance program files and 2360 case files for specific structure.

**REPORTS DUE:**

Annually.

**COSTS:**

\$4,000.

*CULTURAL AND HISTORIC SITE REHABILITATION*

**RESPONSIBILITY:**

Engineering and Recreation Staff.

**RESEARCH NEEDS:**

Special cost data and sources of supply for materials and building supplies that are historically authentic.

**INVENTORY NEEDS:**

Base-line data on authentic historic materials and methods that were used on specific structures.

**MONITORING TOPIC: Wildlife Habitat**

The Forest has seven indicator species that were selected to represent different habitats and give us information on the general condition of the Forest. They are the northern spotted owl, pileated woodpecker, marten, primary cavity excavators, Columbian black-tailed deer and Roosevelt elk. In addition, the bald eagle was also selected because of its Threatened and Endangered status and dependence on the riparian ecosystem.

**THRESHOLD OF VARIABILITY:**

- A. If occupancy of habitat areas by management indicator species deviate more than 20 percent from what is expected.
- B. If populations of management indicator species deviates more than 20 percent from what is expected.

**MONITORING QUESTION:**

- A. Are the management indicator species occupying the habitats as predicted?
- B. Are management indicator species populations within 20 percent of expected numbers at the end of each decade?

**SUGGESTED METHODS/INFORMATION SOURCES:**

- A. 1. Northern spotted owl—field verification to determine if SOHAs are occupied and if occupied whether they contain singles, pairs, or breeding pairs of spotted owls.
- 2. Pileated woodpecker and marten—field verification of habitat areas to determine if habitat areas are occupied.
- 3. Primary Cavity Excavators—field review of timber sale project areas to determine if wildlife trees which are being left are being used by primary cavity excavators.
- 4. Columbian black-tailed deer and Roosevelt elk—field review of deer and elk winter range, during the winter, to determine if elk and deer winter range was correctly identified and is being utilized by deer and elk.
- 5. Bald eagle—field verification of known nesting during the months of March through July to determine nest activity and productivity.
- B. 1. Northern spotted owl—field verification to determine the number of pairs of spotted owls occupying the spotted owl habitat network. This should be done using the standard protocols that the Forest Service uses for the Pacific Northwest Region.
- 2. Pileated woodpecker and marten—field verification of pileated woodpecker and marten use of suitable habitat in areas unavailable for timber harvest.

## *WILDLIFE HABITAT*

3. Primary Cavity Excavators—field review of timber sale project areas to determine the population level of primary cavity excavators using the sale area.
4. Columbian black-tailed deer and Roosevelt elk—coordination with the Washington Department of Wildlife to determine what deer and elk populations are on the Olympic National Forest.
5. Bald eagle—field verification of active nest sites to determine if breeding success is consistent with the Pacific Bald Eagle Recovery Plan.

### **UNITS OF MEASURE:**

- A. 1. Percent of SOHAs occupied.  
Number of spotted owl pairs and singles utilizing SOHAs.
2. Percent of pileated woodpecker and marten habitat areas that are occupied.
3. Percent of recommended number of wildlife trees retained.
4. Percent of identified winter range utilized by elk and deer during periods of heavy snow.  
Acreage of winter range utilized by deer and elk that was not identified.
5. Number of bald eagle nests that are active and the number that produce fledglings during any given year.
- B. 1. Number of spotted owl pairs and singles using the spotted owl habitat network
2. Number of pileated woodpecker and marten pairs and singles utilizing C2 areas or other areas that are unavailable for timber harvest.
3. Number of primary cavity excavators in sample areas by species.
4. Number of elk and deer on the Olympic National Forest.
5. Percent of active nest sites which produce fledglings.

### **MONITORING FREQUENCY:**

- A. 1. Annually for at least 80 percent of all SOHAs.
2. Annually for at least 50 percent of all C2 areas.

3. Annually for at least 25 percent of all timber sales sold during the previous fiscal year.
  4. Annually for 10 percent of the herd areas identified.
  5. Annually for all BEMAs on the Olympic National Forest.
- B.
1. Annually for 80 percent of all SOHAs and 10 percent of all other areas in the spotted owl habitat network.
  2. Annually for 10 percent of all lands suitable for pileated woodpeckers and marten which are unavailable for timber harvest.
  3. Annually for at least 10 percent of all timber sales sold during the previous fiscal year.
  4. Annually for the entire Olympic National Forest.
  5. Annually for all BEMAs.

**PRECISION AND RELIABILITY:**

- A.
1. High precision and reliability.
  2. High precision and reliability.
  3. High precision and reliability.
  4. Moderate precision and reliability.
  5. High precision and reliability.
- B.
1. High precision and reliability.
  2. Moderate precision and reliability.
  3. Moderate precision and reliability.
  4. Moderate precision and reliability.
  5. High precision and reliability.

**DATA STORAGE:**

Oracle or FES database on the Data General computer system located in Olympia at the Supervisors Office of the Olympic National Forest.

## *WILDLIFE HABITAT*

### **REPORTS DUE:**

- A. Annually.
- B. Every 5 years.

Possible reason for unfavorable reports might be:

- A. Natural catastrophes.
- B. Failure to implement standards in this Plan.

### **COSTS:**

- A. 1. \$120,000
- 2. \$26,500
- 3. \$16,000
- 4. \$15,000
- 5. \$7,500
- B. 1. \$12,000
- 2. \$21,000
- 3. \$9,000
- 4. \$2,000
- 5. \$7,500

### **RESPONSIBILITY:**

Forest Fish and Wildlife Program Manager.

### **RESEARCH NEEDS:**

None. See old-growth monitoring topic.

### **INVENTORY NEEDS:**

Wildlife habitat inventory of Forest to determine quality and quantity of habitat available.

**MONITORING TOPIC: Fish Habitat**

Demand for salmon and trout produced within the Forest is expected to increase. Public resource management agencies, commercial and sport fishing industries, Peninsula American Indians, and the general public all have a strong interest in the management of fisheries habitat.

The Forest selected anadromous trout and salmon, and resident trout groups as the biological indicators of the condition of on-Forest fisheries habitat. Monitoring these groups and the condition of their habitat should yield adequate information to detect and/or predict changes in habitat capability.

**THRESHOLD OF VARIABILITY:**

- A. If the Fish Habitat Capability deviates more than 10 percent of that expected.
- B. If the number of projects being implemented deviates more than 20 percent from what is listed in Appendix A.
- C. If Standards and Guidelines are not met by projects affecting habitat on more than 10 percent of the area during the decade.

**MONITORING QUESTIONS:**

- A. What are the cumulative effects of forest activities on fish habitat capability?
- B. Are fish habitat improvement projects being implemented as scheduled in the Forest Plan?
- C. Are fisheries related Standards and Guidelines being implemented and are they adequate?

**SUGGESTED METHODS/INFORMATION SOURCES:**

- A. Estimate the current fish habitat capability. This should include estimates of the previous year's habitat capability and the current year's habitat capability due to habitat improvement work. This will help determine if total fish production on the National Forest has been reduced due to the cumulative effects of forest activities on fish habitat. These estimates should be made on a drainage basis. One method to make these estimates would be to establish one permanent representative fish habitat monitoring reach, 100 meters in length, within each of the major Forest drainages. Determine fish habitat capability for each station based on pool condition class; instream cover, large organic debris, and substrate composition; overhead canopy cover, spawning gravel quality (percent fines), macroinvertebrate community tolerance; and population estimates. Information source for measuring listed monitoring parameters is "Fisheries Habitat Evaluation Handbook," FSH 2609 23 (Monitoring), R-6 FSH 7/85 Amendment 1. Increases in habitat capability due to habitat improvement work should be based on the fish habitat enhancement package used in the Final Land and Resource Management Plan. If actual fish habitat capability is measured, this information should be used.

## *FISH HABITAT*

- B. Field verification of fish habitat improvement projects accomplished.
- C. Field verification that S&Gs are being implemented. Comparison of fish habitat capability from year to year in order to determine adequacy of S&Gs

### **UNIT OF MEASURE:**

- A. Habitat capability measured as the total number of adult fish (by species) the habitat is capable for producing.
- B. Habitat improvement project constructed.
- C. Reports.

### **MONITORING FREQUENCY:**

- A. Annually. A representative sample of drainages will be checked on an annual basis.
- B. Annually. A representative sample of fish projects will be checked on an annual basis.
- C. Annually. A representative sample of drainages will be checked on an annual basis.

### **PRECISION AND RELIABILITY:**

- A. Precision and reliability of fish habitat capability indices is high. Precision and reliability of actual fish habitat capability is expected to be moderate.
- B. High precision and reliability.
- C. High precision and reliability.

### **DATA STORAGE:**

Oracle or FES database on the Data General computer system located in Olympia at the Supervisor's Office of the Olympic National Forest.

### **REPORTS DUE:**

- A. At the end of each calendar year for data collected during the previous fiscal year for all permanent monitoring stations measured.
- B. At the end of each calendar year for all projects monitored during the previous fiscal year.
- C. At the end of each calendar year for reviews conducted during the previous fiscal year.

Possible reasons for unfavorable reports include:

- A. Natural catastrophes.
- B. Failure to implement standards established in this Plan.
- C. Lack of funding.
- D. Inadequate escapement.
- E. Inaccurate models.

**COSTS:**

- A. \$140,000 (\$0)
- B. \$64,000 (\$4,000)
- C. \$20,000 (\$5,000)

**RESPONSIBILITY:**

Forest Fisheries Program Manager

**RESEARCH NEEDS:**

Development of a model that predicts the effects of habitat manipulation on fish habitat capability.

**INVENTORY NEEDS:**

Inventory of Forest fish habitat to determine quality and quantity.

## *WATER QUALITY*

### **MONITORING TOPIC: Water Quality**

Watersheds on the Forest are managed to maintain water quality. Water quality for domestic use is important to people dependent on water from the Forest. It is also important to the maintenance of fish habitat, both on-Forest and downstream. Water quality is influenced primarily by sediment entering the streams and, to a lesser extent, by increased water temperature. Management activities, such as road building and timber harvest, can affect water quality.

### **THRESHOLD OF VARIABILITY:**

- A. Standards and Guidelines are not met by five percent or more of projects affecting water quality.
- B. Zero deviation of water quality standards is permitted.
- C. The number of projects being implemented deviates more than 20 percent from what is listed in Appendix A for soil and water projects.

### **MONITORING QUESTIONS:**

- A. Are water resource-related BMPs and S&Gs being implemented?
- B. Are water resource-related BMPs and S&Gs effective to maintain or enhance beneficial uses of water and assure that water quality parameters are within limits established by State and Federal water quality standards?
- C. Are watershed improvement projects being accomplished as scheduled?

### **SUGGESTED METHODS/INFORMATION SOURCES:**

- A. Interdisciplinary EA and project implementation review.
- B. Quantitative measurement of physical and chemical water quality parameters. Automatic sampling devices should be used for turbidity samples. Grab samples should be used for water chemistry samples. Visual monitoring should be used to assess ground conditions after management activities occur.
- C. Attainment reports.

### **UNITS OF MEASURE:**

- A. Project review report.
- B. Turbidity (NTU) and water chemistry (mg/l). Field evaluation of projects.
- C. Soil and water projects constructed.

**MONITORING FREQUENCY:**

- A. Annual.
- B. Daily/periodic.
- C. Annual.

**PRECISION/RELIABILITY:**

- A. Moderate/high.
- B. Moderate/high.
- C. High/high.

**DATA STORAGE:**

- A. Watershed files.
- B. Watershed files.
- C. Watershed files.

**REPORTS DUE:**

- A. Annually.
- B. Annually.
- C. Annually.

**COSTS:**

- A. \$8,000.
- B. \$36,000.
- C. \$1,000.

**RESPONSIBILITY:**

- A. Forest/District Hydrologist.

## *WATER QUALITY*

- B. Forest/District Hydrologist.
- C. Watershed Staff Officer.

### **RESEARCH NEEDS:**

Water quality standards should be established for silvicultural activities which take into account: natural variability of water quality parameters of forest streams and beneficial uses of the streams.

### **INVENTORY NEEDS:**

There is a need to quantify existing water quality in major watersheds. Parameters such as sediment and water temperature should be determined upstream from the National Forest boundary, and immediately downstream from the last point of potential effect from National Forest activity.

**MONITORING TOPIC: Watershed Cumulative Effects**

Goals for cumulative effects analysis are, to determine if there is a significant potential of downstream cumulative effects occurring both on and off-Forest, and to assess whether water resource values are being maintained or enhanced. Individual management activities within a drainage should have significant effect on downstream beneficial uses. However, when management activities in a drainage are collectively assessed in a cumulative effects analysis, there can be significant effects on downstream beneficial uses. The intensity and type of activities plus slope stability are important factors in determining the magnitude of impacts to water resource values.

**THRESHOLD OF VARIABILITY:**

- A. Greater deviation in coefficients (greater than 30 to 40 percent) than desirable.
- B. Greater deviation from predicted effects (greater than 30 to 40 percent) than desirable.

**MONITORING QUESTIONS:**

- A. Are the coefficients used in the cumulative effects analysis valid?
- B. Are the cumulative effects within the range predicted in the FEIS?

**SUGGESTED METHODS/INFORMATION SOURCES:**

- A. Sediment data should be collected at selected sites where management activities or projects are occurring.
- B. Cumulative effects monitoring data will be evaluated and summarized to determine whether effects are within the range predicted. Activities will be modified if necessary to meet S&Gs. The following techniques should be used, stream surveys (Hankin-Reeves). Landslide inventory by use of aerial photographs and field verification, and sediment data from rivers at U S Geological Survey stream gauging stations.

**UNITS OF MEASURE:**

- A. Volume (tons per day or year).
- B. Stream reach (miles), area (acres) and volume (cubic yards per year), and volume (tons per year).

**MONITORING FREQUENCY:**

- A. Daily.
- B. Every five years, yearly (first year and every four years or when new aerial photographs are available), and continuous.

## *WATERSHED CUMULATIVE EFFECTS*

### **PRECISION/RELIABILITY:**

- A. Moderate/moderate to high.
- B. Moderate/moderate to high.

### **DATA STORAGE:**

- A. Watershed files.
- B. Watershed files.

### **REPORTS DUE:**

- A. Yearly.
- B. Yearly (first year and four to eight years thereafter, yearly, yearly).

### **COSTS:**

- A. Initial: \$25,000; operating: \$36,000.
- B. Initial: \$17,000; operating: \$40,000.

### **RESPONSIBILITY:**

- A. Ranger District hydrologist or soil scientist.
- B. Forest and Ranger District resource specialists (hydrologist, geologist, and fisheries biologist).

### **RESEARCH NEEDS:**

The sediment model which was used to make predictions in the Forest Planning process needs to be verified. A defensible cumulative effects model should be developed in conjunction with establishing a threshold of concern for increased sediment levels.

### **INVENTORY NEEDS:**

Slope stability and sediment data bases need to be developed so that cumulative effects can adequately be modeled. The data should be collected for a long enough time period to account for natural variations from year to year.

**MONITORING TOPIC: Riparian Areas**

Riparian areas are critical to many forest resource values. Riparian vegetation, particularly large trees, is an important component of fish habitat that provides a continued source of large woody debris creating rearing habitat. Riparian areas also play an important role in wildlife habitat. Maintaining stability of riparian areas helps to minimize sedimentation in streams. Riparian areas are heavily used by recreationists and are often associated with gentle slopes conducive to easy road construction. Timber harvesting concerns frequently arise because riparian areas generally support high value timber stands.

**THRESHOLD OF VARIABILITY:**

Standards and Guidelines are not met by ten percent or more of projects affecting riparian areas.

**MONITORING QUESTION:**

Are riparian areas Standards and Guidelines being implemented and are they adequate?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Field Observation. Postactivity review of selected practices by ID Team. Examples: (1) stream-bank condition survey, (2) photo point documentation, (3) vegetative condition survey.

**UNIT OF MEASURE:**

Project review reports.

**MONITORING FREQUENCY:**

Annually (10 reviews for the Forest).

**PRECISION AND RELIABILITY:**

Moderate for both.

**DATA STORAGE:**

Watershed files (2520).

*RIPARIAN AREAS*

**REPORTS DUE:**

End of year.

Possible causes for unfavorable reports might be:

- A. Standards established in this Plan are not being implemented.
- B. Standards are being implemented but are not effective.
- C. Inappropriate scheduling of projects or activities.

**COSTS:**

\$12,000 (\$8,000).

**RESPONSIBILITY:**

Forest Watershed Staff Officer.

**RESEARCH NEEDS:**

None.

**INVENTORY NEEDS:**

Identification of changes in vegetation within riparian areas. We need the first inventory to determine current conditions and a means of automating annual updates.

**MONITORING TOPIC: Soil Productivity**

Soil is one of the basic resources on the Forest. Maintaining soil productivity is important in reaching resource goals. Erosion and mass failure of soils as a result of management activities can increase sedimentation of stream courses. Soil compaction can result in slower vegetative growth rates.

**THRESHOLD OF VARIABILITY:**

Compacted, severely burned, or actively failing areas occupy less than 20 percent of an area after management activities occurred, i.e., if greater than 20 percent, corrective action or further evaluation is necessary.

**MONITORING QUESTIONS:**

Following management activities, is less than 20 percent of the land area compacted, severely burned, or actively failing?

**SUGGESTED METHOD/INFORMATION SOURCES:**

Visual evaluations by soil scientists and quantitative sampling using procedures in “Guidelines for Sampling Some Physical conditions of Surface Soils” (see FSM 2520 R6 Supp. 50), or other appropriate techniques.

**UNIT OF MEASURE:**

Percent of project area impacted.

**MONITORING FREQUENCY:**

Visual observations by Soil Scientists at least one project annually per District. Quantitative sampling at least one Forest project every two years.

**PRECISION AND RELIABILITY:**

Moderate for both.

**DATA STORAGE:**

Watershed files (2520).

*SOIL PRODUCTIVITY*

**REPORTS DUE:**

Annually.

**COSTS:**

\$10,000 (\$0).

**RESPONSIBILITY:**

Forest Watershed Staff Officer.

**RESEARCH NEEDS:**

Establish relationships between soil compaction, slash burning, and removal of surface soil ("A" Horizon) to Forest productivity and recovery rates through time.

**INVENTORY NEEDS:**

Keep a current inventory of all mass wasting and soil erosion areas that are greater than 0.5 acres.

**MONITORING TOPIC: Air Quality**

**THRESHOLD OF VARIABILITY:**

No incidents that do not meet quality standards for Class I and urban air quality control areas, i e, if *any* incidents are reported, corrective action or further evaluation is necessary.

**MONITORING QUESTIONS:**

- A. What is the effect of the Olympic National Forest prescribed fire program on Class I and urban area air quality?
- B. How effective is the State SIP smoke management program?

**SUGGESTED METHODS/INFORMATION SOURCES:**

- A. Forest Service records on prescribed fire fuel consumption and TSP production.
- B. Observation of smoke plume behavior.
- C. Reports of smoke intrusion into Class I and urban avoidance areas.

**UNIT OF MEASURE:**

- A. Fuel consumption/TSP production by each program site.
- B. On-site observation of smoke plume behavior.
- C. Each intrusion incident.

**MONITORING FREQUENCY:**

- A. Each project site during active combustion phase.
- B. Each project site during active combustion phase.
- C. Each incident.

## *AIR QUALITY*

### **PRECISION AND RELIABILITY:**

- A. Moderate precision and reliability.
- B. Moderate precision and reliability.
- C. High reliability of verification.

### **DATA STORAGE:**

- A. District and S.O. files
- B. District and S.O. files.
- C. S.O. and cooperating agency files (DOE, DNR, ONF).

### **REPORTS DUE:**

- A. Each project site with annual summary.
- B. Each project site with annual summary.
- C. Each incident and annual summary.

### **COSTS:**

Estimated Olympic National Forest annual program cost: \$3,600.

### **RESPONSIBILITY:**

R.O. and S.O. Fuels Management personnel.

### **RESEARCH NEEDS:**

Smoke dispersion and effects.

Fuels consumption/TSP outputs.

### **INVENTORY NEEDS:**

Baseline air quality data for Class I and urban areas - Visibility criteria and TSP criteria.

**MONITORING TOPIC: Economic Considerations - Costs and Values**

Activity costs and output values used in FORPLAN analyses played a key role in establishing the land allocations and activities prescribed in this Forest Plan. Substantial changes in the economic variables used in the development of this Forest Plan could affect the appropriateness of the allocations and activities it contains.

**THRESHOLD OF VARIABILITY:**

Current cost and value information should be regularly compared with the costs and values used in Forest Plan development. When differences become sufficient to warrant reassessment of allocations and activities, the Forest Plan FORPLAN formulation should be rerun using updated economic data. The point at which such an action becomes necessary is difficult to define, due to the complexity of the cost and value relationships involved. Changes of 26 percent or less in experienced and traditional costs and values are permitted deviations, before assessment by Forest officers is required.

**MONITORING QUESTION:**

Are the allocations and activities prescribed in this Forest Plan still the most cost-efficient means of meeting Plan objectives?

**SUGGESTED METHODS/INFORMATION SOURCES:**

It will be necessary to update cost and value data on a regular basis. The costs and values having the greatest effect on PNV calculations are as follows:

Costs: Timber management and silvicultural activity costs.

Road-related costs (construction, reconstruction, engineering).

Logging and other timber purchaser costs.

Fish and wildlife habitat mitigation and enhancement projects.

Recreation management costs.

Values: Measures of timber value (appraised stumpage, bid rates, mill values).

Dockside value of commercial fish catch.

Value of recreation outputs (RVDs and WFUDs).

There are several potential sources of cost and value information. Most of the necessary cost data can be taken from experienced costs on-Forest, although periodically revised Regional cost estimates will be needed to

## *ECONOMIC CONSIDERATIONS - COSTS AND VALUES*

track logging costs. Timber value estimates are available in a variety of forms: current appraised stumpage rates and bid rates, Olympic Peninsula mill value estimates developed by the Washington State Department of Natural Resources, and Regional estimates. The cut value timber pricing technique (see FEIS, Appendix B) used in developing this Forest Plan is recommended. Commercial fish and recreation value revisions will occur as RPA and Regional value estimates are updated.

### **UNIT OF MEASURE:**

Dollars per unit of output or activity. Adjustment of all dollar values to a uniform base year will be necessary.

### **MONITORING FREQUENCY:**

Costs and values should be updated annually. FORPLAN allocations should be tested as needed, but at least once every five years.

### **PRECISION AND RELIABILITY:**

Expected to be high for cost information and moderate for value information.

### **DATA STORAGE:**

Forest files (1970).

### **REPORTS DUE:**

Annual reports for changes in costs and values. Results of FORPLAN analyses should be reported whenever such testing occurs.

### **COST:**

\$1,150 (\$750). Includes \$1,000 per year for data gathering and updating, \$1,500 per decade in FORPLAN costs (estimated frequency of analysis; three per decade).

### **RESPONSIBILITY:**

Forest Administrative Officer for costs and values.  
Forest Analyst for FORPLAN.

*ECONOMIC CONSIDERATIONS - COSTS AND VALUES*

**RESEARCH NEEDS:**

None.

**INVENTORY NEEDS:**

None.

## *BUDGETS*

### **MONITORING TOPIC: Budgets**

### **THRESHOLD OF VARIABILITY:**

Funds that deviate more than 25 percent from previous budget levels.

### **MONITORING QUESTIONS:**

Are annual programs and budgets projected in the Forest Plan being realized?

### **SUGGESTED METHODS/INFORMATION SOURCES:**

Monitor budgets and programs of work in relationship to need and projections in Forest Plan; evaluate trends. More timely adjustments, especially in context with remaining years in the Plan period.

### **UNIT OF MEASURE:**

Dollars.

### **MONITORING FREQUENCY:**

Annually.

### **PRECISION AND RELIABILITY:**

High/high.

### **DATA STORAGE:**

Forest Planning records.

### **REPORTS DUE:**

Every year.

### **COSTS:**

\$1,000.

**RESPONSIBILITY:**

Planning Staff and FLT.

**RESEARCH NEEDS:**

None.

**INVENTORY NEEDS:**

None.

*SOCIAL AND ECONOMIC EFFECTS*

**MONITORING TOPIC: Social and Economic Effects**

**THRESHOLD OF VARIABILITY:**

- A. Changes in payments to counties and U.S. Treasury less than plus or minus 20 percent.
- B. Unemployment in counties less than 12 percent.
- C. Changes in local income level less than plus or minus 20 percent.
- D. New housing starts vary plus or minus 35 percent from traditional market.
- E. No significant changes in lifestyles, environmental parameters, community values.

**MONITORING QUESTIONS:**

Are effects of Forest Plan implementation consistent with expectations? Should Forest Planning objectives change to meet changing socioeconomic conditions?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Forest Plan, especially Chapter V, Monitoring; Washington State Department of Commerce and Economic Development; Washington State Department of Employment Security, Status of Timber Receipts to Counties Summaries, Periodical Reports of Economic Indicators; and other sources as appropriate.

**UNIT OF MEASURE:**

Numerous

**MONITORING FREQUENCY:**

Annually.

**PRECISION AND RELIABILITY:**

High/high.

**DATA STORAGE:**

Forest Plan records.

**REPORTS DUE:**

Annually.

**COSTS:**

\$1,000.

**RESPONSIBILITY:**

Planning Staff and Administrative Officer.

**RESEARCH NEEDS:**

Forest Economist position.

**INVENTORY NEEDS:**

Better methodology to interface with Federal and State agencies involved in socioeconomic problems/management.

*STANDARDS AND GUIDELINES - GENERAL*

**MONITORING TOPIC: Standards and Guidelines - General**

**THRESHOLD OF VARIABILITY:**

No results or attained standards that are less than existing Standards and Guidelines, i.e., *any* deviation from Standards and Guidelines or failure to meet goals and objectives will result in corrective action or further evaluation.

**MONITORING QUESTIONS:**

Are Forest Plan Standards and Guidelines being implemented, and do they meet stated goals and objectives?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Some Standards and Guidelines will routinely be monitored as part of scheduled and programmed activities such as review of mineral operation plans, etc. Review is needed for selected activities that may not otherwise be monitored.

**UNIT OF MEASURE:**

Program element or special management unit Standard and Guideline.

**MONITORING FREQUENCY:**

Once every two years.

**PRECISION AND RELIABILITY:**

High/high.

**DATA STORAGE:**

Forest Plan records.

**REPORTS DUE:**

Every two years.

**MONITORING TOPIC: Standards and Guidelines - General**

**THRESHOLD OF VARIABILITY:**

No results or attained standards that are less than existing Standards and Guidelines, e, *any* deviation from Standards and Guidelines or failure to meet goals and objectives will result in corrective action or further evaluation.

**MONITORING QUESTIONS:**

Are Forest Plan Standards and Guidelines being implemented, and do they meet stated goals and objectives?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Some Standards and Guidelines will routinely be monitored as part of scheduled and programmed activities such as review of mineral operation plans, etc. Review is needed for selected activities that may not otherwise be monitored.

**UNIT OF MEASURE:**

Program element or special management unit Standard and Guideline.

**MONITORING FREQUENCY:**

Once every two years.

**PRECISION AND RELIABILITY:**

High/high.

**DATA STORAGE:**

Forest Plan records.

**REPORTS DUE:**

Every two years.

*PROJECT ENVIRONMENTAL ANALYSIS DOCUMENTATION*

**MONITORING TOPIC: Project Environmental Analysis Documentation**

All proposed projects on the Olympic National Forest must be accompanied by the appropriate level of environmental analysis and subsequent documentation.

**THRESHOLD OF VARIABILITY:**

Zero cases without NEPA documentation, i.e., *any* cases without NEPA documentation will result in corrective action or further evaluation.

**MONITORING QUESTION:**

Are proposed activities in compliance with NEPA procedures?

Were projects implemented as stated in NEPA documentation?

**SUGGESTED METHOD/INFORMATION SOURCES:**

Review environmental documents before records of decision are signed, and make periodic field reviews with completed NEPA documents.

**UNIT OF MEASURE:**

Reports reviewed.

**MONITORING FREQUENCY:**

All documents are submitted for review. Activity Reviews will include review of attendant NEPA documentation to see if projects were implemented as planned.

**PRECISION AND RELIABILITY:**

High for both.

**DATA STORAGE:**

Supervisor's Office files (1950), for all projects where the deciding officer is the Forest Supervisor or higher authority Ranger District files (1950) for all other projects.

**REPORTS DUE:**

A recommendation for approval by the deciding officer is considered as the report.

*PROJECT ENVIRONMENTAL ANALYSIS DOCUMENTATION*

Probable causes for an unfavorable report might be:

- A. Inadequate designation of management area boundaries.
- B. Inappropriate project proposals.
- C. Failure to implement projects as described in the project environmental documentation.

**COST:**

\$10,000 (\$10,000).

**RESPONSIBILITY:**

The Forest EA Coordinator shall be responsible for projects approved by the Forest Supervisor or higher authority. The District Ranger shall be responsible for all other projects.

**RESEARCH NEEDS:**

None.

**INVENTORY NEEDS:**

None.

*ROAD MILEAGE*

**MONITORING TOPIC: Road Mileage**

**THRESHOLD OF VARIABILITY:**

Fifteen percent of road miles constructed fail to meet Forest Plan special management unit or area resource management objectives.

**MONITORING QUESTIONS:**

Does the transportation system serve the Management Area Resource objectives within Forest Plan projections?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Conduct an annual interdisciplinary review of road management objectives for the road system serving the review area.

**UNIT OF MEASURE:**

Miles of road.

**MONITORING FREQUENCY:**

Every year.

**PRECISION AND RELIABILITY:**

Moderate/Moderate.

**DATA STORAGE:**

Forest Plan records and TSPIRS, STARS, GIS and TIS.

**REPORTS DUE:**

Every two years.

**COSTS:**

\$5,000.

**RESPONSIBILITY:**

Forest Engineer.

**RESEARCH NEEDS:**

None.

**INVENTORY NEEDS:**

Need to review and update TIS data through completion of Access and Travel Management Plan.

*MINERALS DEVELOPMENT AND REHABILITATION*

**MONITORING TOPIC: Minerals Development and Rehabilitation**

**THRESHOLD OF VARIABILITY:**

Zero cases not implemented as planned.

**MONITORING QUESTIONS:**

Are the Standards and Guidelines for mineral operations reasonable and effective?

**SUGGESTED METHODS/INFORMATION SOURCES:**

Review and evaluate 20 percent of all current mineral activities on the Forest during every scheduled activity review. Review and document results of all locatable or leasable operating plans against actual operating results.

**UNIT OF MEASURE:**

Minerals cases

**MONITORING FREQUENCY:**

During activity reviews and post reviews of all locatable or leasable operations.

**PRECISION AND RELIABILITY:**

Moderate/Moderate

**DATA STORAGE:**

In 2,800 case files.

**REPORTS DUE:**

Activity reviews as scheduled or post operations inspections.

**COSTS:**

\$500.

*MINERALS DEVELOPMENT AND REHABILITATION*

**RESPONSIBILITY:**

Lands and Minerals Staff.

**RESEARCH NEEDS:**

None.

**INVENTORY NEEDS:**

None.

## *INSECT AND DISEASE CONTROL*

### **MONITORING TOPIC: Insect and Disease Control**

#### **THRESHOLD OF VARIABILITY:**

- A. If frequency of infection areas (insect or disease) increases by more than 100 percent in any biannual period. Threshold is 100 percent.
- B. If areas of infection of root disease is less than 10 percent by areas of a stand or the frequency is more than two infection centers per acre.

#### **MONITORING QUESTIONS:**

Are destructive insect and disease organisms remaining below potentially damaging levels following management activities?

#### **SUGGESTED METHODS/INFORMATION SOURCES:**

- A. Bi-annual serial survey by Regional/State specialists.
- B. Stand exams performed for all proposed vegetation manipulation projects.
- C. Intensive disease surveys by qualified personnel when either A or B indicates more than five percent of a stand has infections.

#### **UNIT OF MEASURE:**

- A. Frequency of disease centers - number per acre and change over time.
- B. Area of infection - acres.

#### **MONITORING FREQUENCY:**

- A. Bi-annual aerial flights.
- B. Stand exams should be performed within two years prior to treatment. Latest data should be summarized every two years to coincide with aerial flight information.

**PRECISION AND RELIABILITY:**

- A. Reliability of aerial flights is moderate for determination of mortality and identification of pest.
- B. Stand Exams produce high reliability for mistletoe infections, moderate for root diseases.
- C. Intensive surveys are high in reliability and precision.

**DATA STORAGE:**

- A. Aerial survey maps maintained on hard copy maps at District. Electronic version at Regional Office with potential for Forest and District GIS.
- B. Exam data to be stored in Regional Stand Exam Base, Forest/District TRI and GIS/Root disease locations should be placed on a permanent map layer.

**REPORTS DUE:**

Bi-annually.

**COSTS:**

- A. \$1,000 for aerial surveys.
- B. \$.75 per acre for training and time spent on disease evaluations.
- C. \$3.00 per acre for Intensive Examinations.

**RESPONSIBILITY:**

- A. FPM - Regional Office for aerial flight surveys.
- B. Forest Silviculturist for all other.

**RESEARCH NEEDS:**

None.

**INVENTORY NEEDS:**

None beyond required surveys unless threshold of variability is exceeded or catastrophic damage occurs (wind throw or fire).

## *TIMBER OFFERED*

### **MONITORING TOPIC: Timber Offered**

The amount of timber harvested is a major issue with most people interested in the management of the Forest. The ASQ in this plan was developed to provide the wood needed to supply local industry and maintain local economies and lifestyles while maintaining quality and quantity of fish and wildlife habitat, scenic and recreation opportunities.

### **THRESHOLD OP VARIABILITY:**

Deviation of 15 percent from scheduled amount.

### **MONITORING QUESTIONS:**

Is the Forest offering the cubic foot volume of chargeable timber established by the Plan ASQ? Is the Forest offering the cubic foot volume of nonchargeable timber necessary to achieve the estimated TSPQ?

### **SUGGESTED METHODS/INFORMATION SOURCES:**

Utilize STARS, TSSA and TRACS to maintain records of planned sell and harvested volumes.

### **UNIT OF MEASURE:**

Control is on MMCF based on conversions from MMBF.

### **MONITORING FREQUENCY:**

Annual.

### **PRECISION AND RELIABILITY:**

Sell based on MMBF is high. Precision is moderate for conversion to CF

### **DATA STORAGE:**

TRI, GIS, TMIS, STARS.

### **REPORT DUE:**

Annually.

**COSTS:**

\$1,500.

**RESPONSIBILITY:**

Timber Staff.

**RESEARCH NEEDS:**

Cubic Foot Cruise volume determinations.

**INVENTORY NEEDS:**

Standing volume inventory, plant association models, permanent growth plots.

## *SILVICULTURAL PRACTICES*

### **MONITORING TOPIC: Silvicultural Practices**

Maintaining non-declining flow and sustained yield of timber requires maintenance of stand growth at the levels predicted in the plan and will require attainment of the prescribed intensive silvicultural practices. Successful attainment consists of the prescribed treatment applied at the prescribed stand age.

### **THRESHOLD OF VARIABILITY:**

- A. Average regeneration period less than 3.5 years, i.e., if the average exceeds 3.5 years corrective action or further evaluation is necessary.
- B. Fifteen percent of stands exceed recommended stocking by more than 25 percent at prescribed ages.
- C. Twenty percent variation from prescribed levels of fertilization is permitted.
- D. Less than 75 percent of prescribed stocking of Douglas-fir trees are seed produced at Dennie Ahl Orchard block 09012.
- E. Units do not exceed 60 acres without Regional Forest approval, and Standards and Guidelines are met for variety, dispersal openings and vegetative stages.
- F. Harvest methods are commensurate with Plan objectives in all cases, i.e., methods not commensurate will require corrective action or further evaluation.

### **MONITORING QUESTIONS:**

- A. Are stands adequately restocked within three years?
- B. Is early stocking control (precommercial thinning) completed according to silvicultural prescriptions?
- C. Is fertilization completed on Douglas-fir stands as prescribed?
- D. Is genetic stock utilized for reforestation in the appropriate genetic zone/plant association moisture zone?
- E. Are created openings (clear cuts) within size/distribution limits, and are objectives for variety, dispersal openings and vegetative stages met?
- F. Are harvest methods commensurate with Forest Plan objectives?

### **SUGGESTED METHODS/INFORMATION SOURCES:**

- A. Utilize TRI, GIS and plantation survey records to determine year of harvest and year of origin of new stand at time of establishment survey.

## *SILVICULTURAL PRACTICES*

- B. Maintain prescription data base for stocking control “needs”. Compare prescribed stems per acre and stand age for prescribed treatment with actual accomplishment.
- C. Utilize TRI, GIS, Stand Data Base and “needs” prescription file.
- D. Utilize TRI, GIS and third year stocking/certification exam. All certification exams should contain statement on seed source of projected crop trees.
- E. Use TRI, GIS and STARS to summarize unit/opening sizes.
- F. Track acres by harvest methods utilizing TRACS.

### **UNIT OF MEASURE:**

- A. Year stand origin - year cut/acres.
- B. Stand age in years/acres.
- C. Acres.
- D. Trees per acre – acres.
- E. Acres per opening.

### **MONITORING FREQUENCY:**

- A. through E. - Annually

### **PRECISION AND RELIABILITY:**

- A. High.
- B. High.
- C. High.
- D. Medium.
- E. High.

### **DATA STORAGE:**

- A. through E. - TRI, GIS, STARS, Stand Exam Data and Prescription files.

## *SILVICULTURAL PRACTICES*

### **REPORTS DUE:**

- A. Three years.
- B. and C. - Annually.
- D. and E. - Three years.

### **COSTS:**

- A. \$1,200.
- B. \$600.
- C. \$200.
- D. \$600.
- E. \$400.

### **RESPONSIBILITY:**

- A. through E. - Timber Staff

### **RESEARCH NEEDS:**

- A. Stocking guides for mixed species stands.
- B. Fertilization response for mixed species stands other than Douglas-fir general. Yield response models for various silvicultural practices.

**MONITORING TOPIC: Lands Suitable for Timber Management**

Forested lands determined as unsuitable for timber production will be reviewed to see if the unsuitability determination might have changed. Forest land may be unsuitable because of regeneration problems or due to potential resource damage if harvest is conducted. Current estimates of unsuitability are based on best available extrapolation of conditions based on plant associations and soil types. All areas of forested lands need site specific verification of suitability determination.

**THRESHOLD OF VARIABILITY:**

Five percent net variation in “Suitable” acres.

**MONITORING QUESTIONS:**

Are lands which are identified as not suitable for timber production still unsuitable? (And, are lands which were identified as suitable for timber production still suitable?)

**SUGGESTED METHODS/INFORMATION SOURCES:**

The Forest Land Management Plan GIS layer for suitability should provide the base area/acres for timber suitability. Districts should review suitability within each IRAA as an integral part of IRAA analysis for proposed timber sales. Boundaries between suitable/unsuitable should be determined on the ground.

**UNIT OF MEASURE:**

Acres.

**MONITORING FREQUENCY:**

On going as each IRAA analysis is done Summary report should be completed each five years.

**PRECISION AND RELIABILITY:**

Medium - Reliability should increase as experience is gained.

**DATA STORAGE:**

TRI, GIS map layer.

*LANDS SUITABLE FOR TIMBER MANAGEMENT*

**REPORTS DUE:**

Five year intervals.

**COSTS:**

\$2,000.

**RESPONSIBILITY:**

Timber Staff.

**RESEARCH NEEDS:**

Plant association modeling/soils/suitability correlation.

**INVENTORY NEEDS:**

Plant association mapping.

**MONITORING TOPIC: Old-Growth**

Old-growth forests are extremely valuable both aesthetically and economically. They provide essential habitat for over 50 species of wildlife and are important (especially western redcedar) to American Indians.

**THRESHOLD OF VARIABILITY:**

Acreage meeting the definition of old-growth, as identified in Forest Plan, varies no more than 10 percent of expectations.

**MONITORING QUESTIONS:**

- A. Are acres of old-growth adequate to maintain populations of old-growth dependent species?
- B. Are acres of old-growth consistent with projected Forest Plan levels?

**SUGGESTED METHODS/INFORMATION SOURCES:**

- A. Using TRI and field observations, determine whether old-growth allocations are being retained as specified in the Plan.
- B. Using TRI data base, calculate the difference between projected levels and field data.

**UNIT OF MEASURE:**

Acres.

**MONITORING FREQUENCY:**

- A. Yearly.
- B. Yearly, for the first five years. At five-year intervals thereafter.

**PRECISION AND RELIABILITY:**

High for both.

**DATA STORAGE:**

Wildlife files (2600).

*OLD-GROWTH*

**REPORTS DUE:**

Annually.

Probable causes for unfavorable reports are:

- A. Inaccurate beginning inventory.
- B. Failure to follow standards established in this Plan.
- C. Inaccurate data for empirical timber yield tables.

**COSTS:**

- A. \$2,500 (\$0).
- B. \$2,500 (\$0).

**RESPONSIBILITY:**

Forest Wildlife Staff Officer.

**RESEARCH NEEDS:**

Determination of home range of indicator species to determine adequacy of remaining old-growth acres.

**INVENTORY NEEDS:**

None.

**MONITORING TOPIC: Native Plants**

The protection of species and communities of native plants has emerged as a key issue on the Forest. Impacts to these plants from management activities and from introduced plant and animal species is of primary concern.

**THRESHOLD OF VARIABILITY:**

Condition and number of sensitive, rare, threatened, endangered, or unusual plant species and communities shows declining trend.

**MONITORING QUESTIONS:**

- A. Are management activities such as timber harvest and road building negatively impacting native plant species and communities?
- B. Are introduced plant and animal species negatively impacting native plant species and communities?

**SUGGESTED METHODS/INFORMATION SOURCES:**

- A. Using field observations, determine current condition and trends of native plants, particularly those of concern for their unusual characteristics or rarity.
- B. Using plot data, examine the effects of introduced species on native plant numbers and condition.

**UNIT OF MEASURE:**

Number of located plants. Conditions of plants and plant communities over time.

**MONITORING FREQUENCY:**

Yearly.

**PRECISION AND RELIABILITY:**

Moderate for both, but dependent on level of personnel and funding.

**DATA STORAGE:**

Resource files.

## *NATIVE PLANTS*

### **REPORTS DUE:**

Annually.

Probable causes for unfavorable reports are:

- A. Management activities not following direction of Plan standards and guidelines.
- B. Introduced species of plants or animals having negative impacts on native plant species or communities.
- C. Insufficient or improperly designed data gathering.

### **COSTS:**

\$10,000.

### **RESPONSIBILITY:**

Forest Resources Staff Officer and Forest Botanist.

### **RESEARCH NEEDS:**

Determination of effects of introduced species such as mountain goats on native plant species and communities.

### **INVENTORY NEEDS:**

Location and numbers of sensitive, threatened, or unusual plant species and communities.