

Olympic National Forest Sustainable Roads System

*Resource Assessment Methodologies
Updated March 9, 2015*



for the greatest good

Table of Contents

Recreation Access Needs	2
Factors used to evaluate recreation access needs	2
Legal and Administrative Access Needs	3
Timber Access Needs	3
Aquatic Risk	4
Terrestrial Risk	4
Road Maintenance Risk	5

Recreation Access Needs

The Recreation Access Needs analysis categorized road segments into low, medium, and high priority from a number of different factors. The analysis considered the number of recreation sites, level of previous investment, importance of sites to volunteers and stakeholders, diversity of recreation opportunities, and level of public use.

Factors used to evaluate recreation access needs

Recreation Facility Analysis Rank – All developed recreation sites were ranked in order of investment and priority in 2008 as a part of the Recreation Facility Analysis. Road segments with developed sites on it were assigned an overall average for sites across the road segment.

1. Developed Recreation Sites – The number of developed recreation sites accessed by each road segment were recorded.
2. Dispersed Recreation Sites – A count of known dispersed sites along a given road segment were recorded.
3. Recreational Driving Route – Opportunities for recreational driving routes such as loops and viewpoints were assigned a qualitative score.
4. Unique Experience – Presence of unique experience, something not found elsewhere on the Forest or surrounding areas, was considered.
5. Cultural Site – Presence or absence of known cultural sites along each road segment was recorded.
6. Volunteer and Stakeholder Value – A presence or absence score was assigned to road segments that included or led to sites that were of particular interest to volunteer groups and stakeholders.
7. Assets Maintained to Standard – Based on overall level of recreation sites maintained to Forest Service standards along a road segment.
8. Total Replacement Value – Score given to capital investment levels of infrastructure along road segments.

Each of the factors were weighted differently and combined to create a final overall score. For example, the number of dispersed routes was downplayed since that score was a total count, while the presence and absence scores (0,1) such as unique experience, were weighted more heavily.

The final scores were graphed to identify natural breaks in distribution of values, and then assigned a low, medium and high value. These results were then transferred onto a map for field staff to verify and adjust the results.

The district recreation managers assigned scores for each road segment for the area they manage. Results were compiled and verified by the forest recreation program manager for final scoring.

Legal and Administrative Access Needs

The Legal and Administrative Access Needs analysis sought to categorize road segments into low, medium, and high. Factors used to evaluate the element were the existence and location of easements, maintenance agreements, public facilities, administrative sites, developed rock sources, and special use permits. Lands staff analyzed maps and classified the roads into high, medium, and low priority according to the following:

- **High:** Roads that have easements, either granted or acquired; have maintenance agreements in place; or provide access to public facilities, permitted administrative sites, or developed rock sources.
- **Medium:** Roads that have special use permits or other short-term authorizations have been issued; or provide access to FS internal administrative uses, such as remote repeater sites.
- **Low:** All other system roads.

Timber Access Needs

Timber Access is the need for a road segment to access forest tree plantations for restoration using commercial tree thinning. Timber Access can be considered as the degree of connectivity between roads and tree plantations.

Eight factors were used to assess Timber Access need based on GIS computer modeling:

1. Commercial treatment acres accessed per mile
2. Commercial treatment acres in a given watershed
3. Site productivity
4. Estimated stand volumes
5. Stand ages
6. NWFP Land allocation category
7. Elevation
8. Direct or indirect access level

The factors were weighted based on their perceived potential for commercial tree thinning for forest stand structural restoration. The greatest weights were given to road segments accessing high acres per mile of commercial thinning. A numerical formula was used to combine the Timber Access into “High”, “Medium”, and “Low” ratings with a rating for the current annual level of commercial thinning, a medium annual level of commercial thinning, and a high annual level of commercial thinning based on a 30-year production period.

The computer-generated Timber Access Need ratings for each road segment were reviewed by the Forest Timber and Silviculture Team. During their review, they specifically considered the influence of disturbance processes, present road conditions, future economic viability, and potential for stands to

develop structural attributes needed on the landscape. The team used professional judgment to adjust Timber Access Need ratings where necessary.

Aquatic Risk

Aquatic risk is the potential for a road segment to damage water quality and fish habitat by causing landslides, introducing sediment, altering riparian areas, or limiting natural channel movement. Aquatic risk can be thought of as the degree of connection or connectivity between roads and streams.

Five factors were used to assess aquatic risk based on GIS computer modelling:

1. Geologic Hazard
2. Proximity to Fish Habitat
3. Stream Crossing Density
4. Proximity to Stream Channels
5. Upslope Hazard

The factors were weighted based on their perceived importance in creating stream impacts. The greatest weights were given to road segments with a high potential to create landslides that would deliver to fish habitat. A numerical formula was used to combine the five factors into “High”, “Medium”, and “Low” ratings with roughly one third of the total road miles in each category.

The computer-generated Aquatic Risk ratings for each road segment were reviewed by the Forest Aquatic Team. During their review, they specifically considered stream-adjacent road segments, potential delivery of sediment to anadromous fish streams, and potential delivery of sediment to municipal water supplies. The team used professional judgment to adjust Aquatic Risk ratings where necessary.

Terrestrial Risk

Terrestrial risk is the potential for a road segment to affect wildlife and botanical species habitat by causing degradation or fragmentation of habitat, and disruption of life history function. Terrestrial risk can be thought of as the degree of connection or connectivity between roads and upland or riparian habitats.

Nine factors were used to assess terrestrial risk based on GIS computer modelling, local knowledge and professional judgment:

1. Critical areas of botanical species and habitats
2. Critical areas of federally listed wildlife species and habitats
3. Invasive plant infestations
4. NWFP land management allocation
5. Snag and coarse wood
6. Open road distance to core habitat (un-fragmented block of habitat)
7. Road proximity to headwater aquatic habitat
8. Distance from human activity centers
9. Road density

The factors were weighted based on their perceived importance in creating impacts to terrestrial species, populations, and their associated habitats. The greatest weights were given to road segments with a high potential to create habitat fragmentation and disruption to federally listed species and species of concern. A numerical formula was used in each category which was then combined into a “High”, “Medium”, and “Low” rating for each road segment.

The Terrestrial Risk ratings for each road segment were reviewed by the Forest Botany and Wildlife Team. During their review, they specifically considered the influence of road-related affects to species such as fragmentation, disturbance, and potential loss of habitat quality. The team used professional judgment to adjust Terrestrial Risk ratings where necessary.

Road Maintenance Risk

Road maintenance risk reflects the potential cost of ownership based on road operation and maintenance history and needs. It can also be considered an indicator for damage potential during storms.

Six factors were identified as principle considerations for this resource evaluation:

1. cost and/or frequency of maintenance;
2. performance history;
3. storm damage history;
4. terrain or location considerations;
5. construction method; and
6. road age.

Within each of these there are varying degrees of knowledge or available data on hand to conduct the analysis. Road maintenance history and storm damage history were the primary elements used in the final ratings. For this analysis scale ERFO records were examined, and current and past Road Managers and Maintenance Engineers were consulted. We relied on anecdotal information and professional judgment for identifying roads that required the most maintenance and those that require the least maintenance over time.

Cost and frequency of maintenance and repair are closely linked to use, construction method, and terrain or road location. Construction method is not readily available without more detailed or site specific assessment. Age is a factor that may provide a surrogate for construction method, however, neither was used for this analysis. Those factors as well as current condition are recommended for more detailed project level assessment where changes to the current transportation system are being considered.

RATING:

Road segments were rated as high when the cost or frequency of maintenance was high, or when storm damage resulted in costly repairs. Repetitive storm damage sites and sites qualifying for ERFO are included in this group. Road segments were rated low when the road managers indicated a particularly low maintenance frequency or cost. Roads that met neither category were rated as medium, and are interpreted as having average or typical cost/mile to maintain. A fourth category was identified as un-rated. This includes most of the Operational Maintenance Level 1 roads that are closed to motor vehicle access and receive little maintenance currently.