

WATERSHED ACTION PLAN
For Olympic National Forest Lands within the
Dungeness River Watershed
1711002003

September 22, 2016



Dungeness River Watershed Action Plan
Hood Canal Ranger District, Olympic National Forest

The Dungeness watershed has been the focus for numerous committees, studies, and government projects to recover depleted wild stocks of salmon, restore salmon habitat, improve water quality and the overall condition of the watershed. The Olympic National Forest (ONF) has participated with other government agencies, citizens, and stakeholders to develop long-term management of the river and its resources, outline watershed restoration priorities, and implement the actions.

This plan contains an aquatic and terrestrial watershed restoration strategy that incorporates recreational opportunities on the Olympic National Forest in the Dungeness 5th field watershed. The plan identifies restoration actions needed to correct known problems and help to put National Forest System (NFS) lands on a trajectory to improve the watershed condition. The 179,300 acre watershed and project analysis area includes both public and privately-owned lands, but with a primary focus on NFS lands. The Dungeness River begins in the snow fields at the southeast face of Mt. Mystery and flows through the foothills across the Sequim-Dungeness Valley, and enters the Strait of Juan de Fuca. The watershed is a municipal water supply and within close proximity of Sequim, Washington.

The Dungeness River serves as crucial refugia for maintaining and recovering four species of fish listed under the Federal Endangered Species Act: Puget Sound Chinook, Puget Sound steelhead, Hood Canal summer chum, and Coastal Puget Sound bull trout. Federally Designated Critical Habitat for Puget Sound Chinook and Coastal Puget Sound bull trout also fall within the watershed. The watershed provides habitat for fall chum, pink salmon, and Puget Sound Coastal cutthroat trout. The aquatic habitat restoration strategy portion was developed with a focus on the federally listed species, and other salmon and trout species. Benefits to other aquatic species and improvements to water quality are also anticipated from the restoration activities identified in this strategy.

Three wildlife species listed under the Endangered Species Act occupy the Dungeness watershed: marbled murrelet, northern spotted owl, and Taylor's checkerspot butterfly. Federally Designated Critical Habitat for all three species fall within the watershed. Restoration and enhancement activities critical to the recovery of the species were identified in this plan, including work in two Botanical Areas where the endangered Taylor's checkerspot butterfly lives. The plan also includes actions to improve habitat for Forest Service Region 6 Sensitive Species, game species, small mammals, migratory birds, bats, cavity users, small amphibians, and invertebrates. Though commercial thinning is an important action for developing forested stands for many wildlife species, the Olympic National Forest recognized the complexity of identifying appropriate age and stand conditions would not meet the timeframe allocated for the collaborative process. Restoration activities that include removal of larger diameter trees for commercial sale will be addressed in future planning efforts.

The Forest Service's Pacific Northwest Region Aquatic Restoration Strategy is a region-wide effort to protect and restore aquatic habitat across Washington and Oregon. The strategy relies on a collaborative approach to restoration and on focusing available resources in selected high priority watersheds to accomplish needed restoration activities on national forest system lands as well as other ownerships. In 2010 the Olympic National Forest selected the Dungeness River watershed (5th field) as a "Focus Watershed".

Dungeness River Watershed Action Plan
Hood Canal Ranger District, Olympic National Forest

The first step in the “Focus Watershed” process was to form a collaborative group of interested individuals to develop and implement a multi-year action plan aimed at promoting recovery of key aquatic processes and functions in the Dungeness River watershed. In 2011, a collaborative team was formed to create the Watershed Action Plan for National Forest Service managed lands within the Dungeness River 5th field watershed. The objective was to identify all high priority actions needed to protect and restore salmon and trout habitat, and terrestrial habitat within the watershed. While the focus of the group was on National Forest lands, the group also identified high priority aquatic restoration needs on other ownerships throughout the watershed. The group also identified high priority recreation projects for the Dungeness watershed and a portion of the adjacent Jimmycomelatey watershed.

The collaborative group included members of the Dungeness River Management Team, The Wilderness Society, North Olympic Lead Entity for Salmon Recovery, Back Country Horsemen of Washington, Olympic National Park, Dungeness River Audubon Center, OHV clubs, Olympic Park Associates, Sierra Club, Clallam County, U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife, and Olympic Forest Coalition. Individual members of the public were also engaged in the process. A series of field trips, public meetings, and workshops were conducted to solicit input during the year-long process. The core team of partners worked collectively to review the assessment of watershed resources, aquatic and terrestrial habitat conditions, recommended and prioritized restoration activities, and recreation opportunities in the NFS portion of 5th field watershed. Recommended activities were compiled in 2012 into a prioritized spreadsheet and maps. The collaborative group reviewed the prioritized list of restoration opportunities at a public workshop in May 2012. The products are shared on the Olympic National Forest website:

<http://www.fs.usda.gov/detail/olympic/workingtogether/partnerships/?cid=stelprdb5321771>

This 5th field Dungeness watershed action plan documents the collaborative group recommendations from 2012, updates with some work that has been completed over the last few years, and identifies ongoing efforts. As the Olympic National Forest moves towards environmental analysis of many of these proposed activities, this watershed action plan will provide a foundation for these future planning efforts.

This action plan, developed within the collaborative framework, identifies the high priority work which is needed to protect and restore watershed health, water quality, fish and terrestrial habitat on National Forest System lands within the Dungeness watershed. It targets the correction and improvement of conditions that pose a high risk to these resources, provides estimated costs for the work, and outlines a general schedule for completion. The plan also demonstrates the alignment to larger scale efforts including: Northwest Forest Plan; Forest Service Pacific Northwest Region Aquatic Restoration Strategy; Olympic National Forest Strategic Plan; Olympic National Forest Site-Specific Invasive Plant Treatment Project; Salmon Restoration Projects; Clean Water Act water quality improvement plans; and recovery plans for the federally listed species that inhabit the watershed.

A total of 69 actions were identified for watershed restoration; five activities for terrestrial restoration; and an additional 12 projects for recreation opportunities benefiting multiple resources. The Forest Service technical team (fisheries, soils, watershed, wildlife, botany, silviculture, recreation, and engineering) received recommendations for project ideas from the collaborative

Dungeness River Watershed Action Plan
Hood Canal Ranger District, Olympic National Forest

group, along with providing their own recommendations during the process which cumulated into the development of a project list (Appendix A). The list was developed from field investigations and validations through GIS analysis and supporting reference documents. The technical team provided an estimate of restoration and recreational opportunity investment for each project; it does not include adjustment for inflation or costs for planning and environmental compliance, design, permitting, project administration and implementation oversight or monitoring. Once the list of proposed projects was assembled, the Forest Service technical team conducted a numerical rating for each project in order to quantify the relative importance of each project. The technical team met with the collaborative group for a one-day workshop to review the project criteria and prioritized projects by program area (i.e., fish, roads, terrestrial, and recreation). The District Ranger approved the recommendations of the collaborative group, with the understanding that the order and which specific projects will be carried forward may change due to type of available funding, agency direction, changed environmental conditions, or input during public scoping in the NEPA planning process. All projects will require some level of NEPA. Several projects on the list were identified as needing further review by the Forest Service before making a decision to proceed with the recommended action. An example is the proposed Trails Study Area in the Upper Dungeness 6th field subwatershed and adjacent Jimmycomelately watershed. The project was developed and brought forward by the Back Country Horsemen of Washington and is a trail system of new and existing roads converted to non-motorized or motorized trails, new trailheads and campsites. Before the Forest can move forward, the proponent would need to further develop the proposal by identifying a strategy to finalize the design, fund the required NEPA planning, and have a strategy to maintain the infrastructure in the long-term.

Links:

Dungeness Watershed Action Plan Collaborative Group:

<http://www.fs.usda.gov/detail/olympic/workingtogether/partnerships/?cid=stelprdb5321771>

Dungeness River Management Team (DRMT) website: <http://home.olympus.net/~dungenesswc/>

ACKNOWLEDGEMENTS: The Dungeness Watershed Action Plan Working Group participants that contributed to the development of this restoration strategy include: Mike Anderson, The Wilderness Society; Scott Chitwood, Jamestown S' Klallam Tribe; Tim McNulty, Olympic Parks Associates; Rebecca Wolf, Sierra Club; Ross Krumpke; John Woolley, Olympic Forest Coalition; and Jeff Chapman, Back Country Horsemen of Washington.

OVERVIEW OF THE DUNGENESS WATERSHED

Dungeness Watershed – 1711002003 (HUC) – 5th Level Watershed

Location: The Dungeness 5th field watershed lies in the northeast corner of the Olympic Peninsula of Washington, near the town of Sequim.

Watershed Area: The Dungeness River watershed drains a 127,037 Acres and is one of the steepest rivers in the United States. The ONF portion of the watershed comprises 43% of the entire watershed (55,792 acres). The Strait of Juan de Fuca is located approximately 11 river miles north (downstream) of the Olympic National Forest (ONF) boundary.

Four 6th field subwatersheds are within the ONF portion of the 5th field Dungeness watershed:

- Middle Dungeness River, 171100200306 – 18,664 Acres (Total) – 8,330 Acres (USFS)
- Lower Gray Wolf River, 171100200305 – 15,835 Acres (Total) – 12,645 Acres (USFS)
- Upper Dungeness River, 171100200302 – 14,576 Acres (Total) – 14,441 Acres (USFS)
- Headwaters Dungeness River, 171100200301 – 31,148 Acres (Total) – 20,106 Acres (USFS)

A subwatershed - McDonald Creek, 171100200401 – 14,372 Acres (Total) – 2688 Acres (USFS) - is included in this restoration strategy due to its location adjacent to the Dungeness, and its isolated location as the only NFS parcel in the Port Angeles Harbor 5th field watershed.

Climate: The climate of the northeastern portion of the Olympic Peninsula is mild, reflecting the moderating influence of winds from the Pacific Ocean, and the ‘rain shadow’ effect of the Olympic Mountains. The Dungeness River watershed is a glacier and snowmelt fed system, with a high percentage of the watershed located in the snow-dominated zone, and the lower portion of the watershed is predominantly a rain-on-snow (November-May) system. The lower reaches of the watershed outside of NFS lands are rain-dominated. Average daily stream discharges are substantially influenced by rates of snow accumulation and snowmelt within the Dungeness Watershed. Occasional spikes in the hydrograph during November through March are common from high flows associated with rain-on-snow events. Annual precipitation ranges from 80 inches at its highest elevation to 15 inches in the lower drainages.

General Watershed Physiography: The Dungeness River originates from glaciers in the Olympic National Park and the Buckhorn Wilderness area of the Olympic National Forest, carves its way through marine basalt, sedimentary rocks, and alpine and continental glacial till down to where it enters Dungeness Bay and the Strait of Juan de Fuca marine environment. The Dungeness Watershed was once covered by continental glacial ice, resulting in moderately sloping terrain with complex, rolling topography. An extensive area of a complex deposit of glacial lacustrine sediments with layers of glacial till and or outwash was left in the Dungeness watershed area. Downcutting through these unconsolidated glacial materials has formed steep, incised tributaries and inner gorge terrain along the mainstem of the Dungeness and Gray Wolf Rivers, creating large areas of deep-seated mass movement upslope. Shallow-rapid mass wasting is associated with steep slope gradients and relatively, shallow to moderately deep soils. Glacial deposits remain on some midslopes and lower slopes and depending on slope gradient and configuration, have mass wasting potential. Often glacial deposits have seasonal water tables

along contacts with denser or finer textured layers which contribute to elevated pore water pressure and instability.

Land Use: The history of human habitation of the watershed dates back 11,000 years. Archeological excavation sites near Sequim provide evidence of human inhabitation of the Dungeness watershed after the last glaciers receded. Anthropological study of local Native Americans in the watershed found that the area was used for hunting, fishing, and providing other foods such as huckleberries. When European settlers arrived in the Strait of Juan de Fuca and Puget Sound in the 1800's, they found occupied native villages and camps along the shores and bays. Today, the economic base of the Dungeness watershed depends on agriculture, tourism, and service industries that support the retirement community, as well as forestry and fisheries. The Dungeness watershed provides a wide variety of recreational opportunities including more primitive types of recreation such as hiking, fishing, and backpacking. It is one of the most highly visited watersheds on the Forest due to its close proximity to residential areas and access to the Buckhorn Wilderness and Olympic National Park. The NFS lands has six trailheads, one campground (Dungeness Forks), numerous dispersed camp areas, 13 miles of motorized trail, and 53 miles of non-motorized trail (of which 32 miles are in the Buckhorn Wilderness) available for public use.

The Dungeness River is heavily influenced by past clear cut logging and a road network located within inner gorge landforms on unstable relic proglacial lake deposits. A large proportion of vegetation is homogenous stands of second growth western hemlock, many in very dense "dog-hair" stands.

Since 1994, the management direction on NFS lands (under the Northwest Forest Plan) within the watershed has changed from emphasizing resource extraction to a focus on restoration. Clearcut timber harvesting has been replaced by commercial and pre-commercial thinning in existing plantations to help accelerate the development of late-successional forest characteristics.

Wildlife: Forest Service lands in the watershed are a matrix of older late-successional unmanaged forests, young regenerating forests that originated from timber harvest, thin-soiled balds and other forest openings. Anthropogenic actions, including vegetation alteration, fragmentation, reduction of standing dead and down wood, and suppression of natural fire regimes, has affected plant communities and composition throughout the watershed. As a result, densely stocked stands, fewer large diameter snags, encroachment of woody trees and shrubs in historically open areas, and the establishment of invasive plants has either, singularly or combined, affected suitability of the landscape to provide habitat to the wildlife in the watershed. The lower elevations of the watershed is habitat for both the northern spotted owl and marbled murrelet. The Dungeness watershed is the highest elevation of Taylor's checkerspot known in the state, and the only location on NFS lands. The checkerspot is the only federally endangered species on the Olympic National Forest with 160 acres of critical habitat (early seral, short-statured plant communities with native grass and forbs with little or no overstory forest vegetation) located in three parcels in the watershed. Roosevelt elk use of the watershed reflects historic and current land management practices; the reduction of forage created from timber harvest has shifted elk patterns in the watershed onto residential areas. High quality Columbia black-tailed deer habitat is generally found at lower elevations (less than 1,500 feet); deer use in the NFS portion of the watershed is minor compared to other portions of the watershed.

Roads: Most of the roads within the subwatershed are located on landforms considered sensitive to road construction and changes in hydrology. The Olympic National Forest Soil Survey identifies the presence of relic pro-glacial lakebed deposits and inner gorge landforms over much of the watershed. Deep-seated landslides are a common feature associated with these landforms. Roads constructed on these landforms have had a number of problems that affect conditions both adjacent to the road (on-site) and downstream (off-site). Erosion, water quality, and impacts to aquatic habitat are primary concerns.

Most of the forest roads within the Dungeness subwatershed were built in the 1960's, using common construction specifications of the time. Some of these roads would likely not have been built today, or would have been constructed using better techniques and safeguards for environmental concerns. Lack of funding to maintain the road drainage systems coupled with continued erosion and slope instability has created a deteriorating condition where erosion and damage is occurring even during modest storms. The resulting pulses of coarse and fine sediment (and elevated stream flow) are transported directly to the nearby mainstem of the Dungeness River. As culverts plug and fail, the resulting increased flow of water and debris often scours first and second-order channels and undercuts the channel slopes, creating additional erosion.

Vegetation: The vegetation found in the watershed is as varied as the topography. Eight forest vegetation zones and five non-forested plant communities occur or have occurred in the watershed. In the Forest Service portion of the Dungeness, the primary vegetation is coniferous forest. The forested zone types that occur are Western hemlock and Pacific silver fir. The majority of timber was harvested in the 1970's and 1980's. Recent vegetation management in the area has been primarily focused on commercial and pre-commercial thinning of Adaptive Management Area stands to promote habitat diversity and accelerate late-successional forest characteristics. The Olympic National Forest has a diversity of unusual plant communities; the Dungeness has the highest number of designated Botanical Areas of any watershed on the Forest. The six Botanical Areas (Three Peak's, Buckhorn, Cranberry Bog, Pat's Prairie, Three O'Clock Ridge, and Tyler Peak) were identified as unique or unusual in terms of presence and diversity of plant species, plant community composition, population of endemic plants and sensitive species, proximity of these unique species from other populations. The establishment and expansion of invasive plants pose a threat to the environmental and economic health by degrading terrestrial and aquatic habitats, displacement of native plant species, and changing the aesthetic landscape affecting recreational values. In the watershed, invasive and undesirable non-native plants are found along roads, trails, former rock pits, trailheads, campsites, and natural areas. Lack of funding to eliminate or substantially reduce the spread of invasive plants has required the Forest to prioritize treatment area.

Management Direction: The Olympic National Forest Land and Resource Management Plan of 1990, as amended by the Northwest Forest Plan (1994), provide management direction for National Forest System lands within the Dungeness watershed. The plans provide management direction on the National Forest in the form of goals, desired future conditions, land allocations, and standards and guidelines. Under the Northwest Forest Plan, the primary land designation within NFS lands in the Dungeness River watershed is Late Successional Reserve (LSR), Adaptive Management Area (AMA), Riparian Reserve, and congressionally designated Wilderness (Buckhorn Wilderness).

Under the Olympic National Forest Land and Resource Management Plan, six land allocations pertain to the Dungeness watershed: Wilderness, Botanical Area, Timber Management Areas, Municipal Watersheds, Visual Management, Undeveloped Recreation, and Proposed Wild & Scenic Rivers.

The Dungeness River Watershed is a Tier 1 Key Watershed (USDA and USDI 1994). The Dungeness River is also designated as a Focus Watershed for aquatic restoration within the USFS, Pacific Northwest Region, Aquatic Restoration Strategy (2007). The watershed is one of the seven High Priority Watersheds on the Olympic National Forest because of the potential of NFS lands to help maintain and restore wild anadromous fish stocks.

GOALS AND OBJECTIVES

The goals of the Dungeness Watershed Action Plan are to improve water quality, and enhance fish habitat throughout the drainage, enhance terrestrial habitat conditions, repair or restore recreation sites, and identify future recreational opportunities.

The desired condition for the watershed is a resilient and properly functioning watershed which exhibits appropriate water quality and quantity, diverse and complex aquatic, riparian and terrestrial conditions, and self-sustaining wild populations of anadromous and resident fish species.

Goals:

- 1) Maintain, improve, and restore natural watershed processes within the Dungeness watershed.
- 2) Use the best available science and reference information.
- 3) Involve community in the stewardship of their public lands.
- 4) Create sustainable infrastructure (e.g., roads, trails) within the watershed.
- 5) Develop a framework that fosters future collaboration.

Objectives:

- 1) Enhance and protect water quality and quantity.
- 2) Enhance riparian, aquatic, and terrestrial ecosystems to benefit fish, wildlife, and humans.
- 3) Engage the broadest spectrum of the community.
- 4) Identify and prioritize high priority projects needed for restoration and protection within the watershed. Priorities will be selected that are science-based.
- 5) Incorporate current information on climate change for the Olympic Peninsula.
- 6) Identify leaders in the community that will make this effort and future efforts successful.
- 7) Utilize an integrated approach within the Forest Service and community to promote and facilitate implementation of the Action Plan.

The objectives within the plan are consistent with larger scale efforts including the alignment with the following National, Regional, and Forest Priorities:

- U.S. Forest Service Watershed Condition Framework (2011).

Dungeness River Watershed Action Plan
Hood Canal Ranger District, Olympic National Forest

- Olympic National Forest Forest-wide Travel Analysis Report (2015).
- U.S. Forest Service, Pacific Northwest Region, Aquatic Restoration Strategy (2005) – the Region has designated Puget Sound as one of 7 Priority Basins and the Dungeness River as one of 50 Focus Watersheds for restoration actions.
- Olympic National Forest Land and Resource Management Plan as amended by the Northwest Forest Plan (1994) – the Dungeness is a Tier 1 Key Watershed with an emphasis to maintain and restore aquatic conditions.
- Olympic National Forest Strategic Plan (2004) – identified the Dungeness watershed as one of 7 Forest priority watersheds for aquatic restoration.
- Olympic National Forest Access and Travel Management Plan (2003) – recommends the future road system needed to address access and aquatic risk.
- U.S. Forest Service National Strategy and Implementation Plan for Invasive Species Management (2004).
- U.S. Forest Service, Pacific Northwest Region, Terrestrial Conservation and Restoration Strategy (2012) – the Region recognizes balds and open dry meadows as a priority habitat.

Alignment with State or local goals includes:

- Dungeness River Management Team, Recommended Restoration Projects for the Dungeness River (1996).
- North Olympic Lead Entity Salmon Recovery Strategy (2008).
- Puget Sound Partnership, 2012 Action Agenda for Puget Sound.
- U.S. Forest Service and Washington State Department of Ecology Clean Water Act Memorandum of Understanding (2000) – helps FS meet commitments in MOA regarding Federal and State water quality laws.
- Puget Sound Chinook Recovery Plan (2007).
- Draft Recovery Plan for the Coastal Puget Sound Distinct Population Segment of Bull Trout (2004).

CURRENT WATERSHED CONDITIONS

Each sixth level watershed is given a condition classification and are rated according the Watershed Condition Framework – FS-977. In 2015, the Olympic National Forest updated the watershed condition class ratings utilizing the 2010 Forest Service Watershed Condition Classification Technical Guide.

http://fsweb.wo.fs.fed.us/wfw/watershed/classification/watershed_classification_guide-oct-25-2010.pdf

The following indicators were given numerical values by an interdisciplinary team of Forest resource specialists under guidance of the Watershed Condition Framework (Table 1). The values were weighted to develop the watershed condition class ratings.

Table 1 - Watershed Condition Indicators, Dungeness Watershed.

AQUATIC PHYSICAL INDICATORS	
1. Water Quality	This indicator addresses the expressed alteration of physical, chemical, and biological components of water quality.
2. Water Quantity	This indicator addresses changes to the natural flow regime with respect to the magnitude, duration, or timing of the natural stream flow hydrograph.
3. Aquatic Habitat	This indicator addresses aquatic habitat condition with respect to habitat fragmentation, large woody debris, and channel shape and function.
AQUATIC BIOLOGICAL INDICATORS	
4. Aquatic Biota	This indicator addresses the distribution, structure, and density of native and introduced aquatic fauna.
5. Riparian/Wetland Vegetation	This indicator addresses the function and condition of riparian vegetation along streams, water bodies, and wetlands.
TERRESTRIAL PHYSICAL INDICATORS	
6. Roads and Trails	This indicator addresses changes to the hydrologic and sediment regimes due to the density, location, distribution, and maintenance of the road and trail network.
7. Soils	This indicator addresses alteration to the natural soil condition, including productivity, erosion, and chemical contamination.
TERRESTRIAL BIOLOGICAL INDICATORS	
8. Fire Regime or Wildfire	This indicator addresses the potential for altered hydrologic and sediment regimes due to departures from historical ranges of variability in vegetation, fuel composition, fire frequency, fire severity, and fire pattern.
9. Forest Cover	This indicator addresses the potential for altered hydrologic and sediment regimes due to the loss of forest cover on forest land.
10. Rangeland Vegetation	This indicator addresses impacts to soil and water relative to the vegetative health of rangelands.
11. Terrestrial Invasive Species	This indicator addresses potential impacts to soil, vegetation, and water resources due to terrestrial invasive species (including vertebrates, invertebrates, and plants).
12. Forest Health	This indicator addresses forest mortality impacts to hydrologic and soil function due to major invasive and native forest pest insect and disease outbreaks and air pollution.

Dungeness River Watershed Action Plan
Hood Canal Ranger District, Olympic National Forest

The three watershed condition classes are directly related to the degree or level of watershed functionality or integrity:

- Functioning Properly
- Functioning at Risk
- Impaired Function

The five sixth level watersheds included in this action plan have the following ratings:

Headwaters Dungeness River – 171100200301 – Functioning Properly

Upper Dungeness River - 171100200302 – Functioning Properly

Lower Gray Wolf River - 171100200305 – Functioning Properly

Middle Dungeness River – 171100200306 – *Functioning at Risk*

MacDonald Creek - 171100200401– *Functioning at Risk*

Watershed ratings for all watersheds managed by the USFS can be found online:

<http://apps.fs.fed.us/nfs/nrm/wcatt/>

The watershed ratings do not reflect the need for all watershed restoration on the ground in the Dungeness Watershed. The ratings are relative and were developed using the national approach which includes impaired watersheds that have been mostly consumed by wildfire or abandoned mines, or other combinations of widespread degradation and natural disaster. In the Dungeness Watershed, there are miles of roads and several aquatic organism passage projects that need to be restored. These actions will have a positive effect on the watershed condition and need to be included in future NEPA analysis.

Table 2 describes the specific indicators that the USFS proposed aquatic restoration activities will improve.

Table 2. Attributes/Indicators within Forest Service Ability to Affect, Dungeness Watershed.

ATTRIBUTES/INDICATOR	REASON FOR RATING
1.0 Water Quality	Fine sediment input from roads and deteriorating crossings were identified with field inventory as factors contributing to degraded stream conditions. Water quality was rated as “functioning properly” for the subwatershed.
3.1 Aquatic Habitat -Habitat Fragmentation	Undersized culverts have fragmented habitats and caused barriers to aquatic organisms primarily in resident fish reaches of the subwatershed. Habitat fragmentation was rated as “functioning at risk” for the subwatershed.
3.2 Aquatic Habitat – Large Wood	Lack of instream large wood resulting from riparian harvest and stream cleaning has led to decreased sinuosity, over steepened channel slope, lack of floodplain roughness, decreased pool densities, less off-channel habitat, and a reduction of spawning gravel. Large wood was rated as “functioning at risk” for the subwatershed.
3.3 Aquatic Habitat – Channel	Large woody debris density and habitat complexity levels are low in the mainstem river. Lack of floodplain connectivity, off-channel habitats, reduced slack water hiding cover, little retention of sediment and nutrients, little pool habitat. Impaired channel shape and function. Channel was rated as “functioning at risk” for the subwatershed.
6.0 Roads & Trails	Road density, road proximity to water, maintenance needs, and a history of road-related mass wasting are all significant contributors of this watershed. Roads & trails were rated as “impaired” for the subwatershed.
6.4 Mass Wasting	Decommissioning unneeded roads that present high risk to aquatic resources will greatly reduce the potential for future road-related mass wasting events.

Table 3 describes the indicators that the non-USFS proposed restoration activities will improve.

Table 3. Attributes/Indicator beyond Forest Service Ability to Control the Affect – Other Parties Will Need to Address, Dungeness Watershed.

ATTRIBUTES /INDICATOR	REASON FOR RATING
2.1 Water Quantity	Water diversions start occurring downstream of National Forest lands and increase in number as you move down the watershed.
3.1 Habitat Fragmentation	The water diversion, for WA State Dungeness Fish Hatchery, on Canyon Creek is a barrier to anadromous fish. Recent funding through the State will fund installation of a fish ladder to allow fish to pass above the water diversion weir.
3.2 Large Woody Debris	Lack of instream large wood in the reach downstream of NFS ownership has led to decreased sinuosity, modified channel slope, lack of floodplain roughness, decreased pool densities, less off channel habitat, and reduction of spawning gravel retention.
3.3 Channel	Large woody debris density and habitat complexity levels are low in the reach downstream of NFS ownership. Lack of floodplain connectivity, off channel habitats, reduced slack water hiding cover, little retention of sediment and nutrients, little pool habitat. Impaired channel shape and function.
5.1 Riparian Vegetation	Dominant tree species within the floodplain areas in the reach downstream of NFS ownership have been converted from conifer to deciduous species or removed due housing development and farming.

OVERVIEW OF CONCERNS AND OPPORTUNITIES

When shifting projects from the list to implementation there may change due to type of available funding, agency direction, changed environmental conditions, or as a result of public scoping in the NEPA planning process. Consideration of all potential activities within the project analysis area will ensure that the sequence of activities will follow a timeline that work favorably together. For example, pre-commercial thinning will be completed prior to closing or decommissioning a road.

Water Quality

The primary threats to aquatic habitat and species within the Dungeness watershed include degraded water quality from sedimentation and a loss of stable instream large wood in the mainstem Dungeness River.

Water quality is degraded in the Dungeness watershed as a result of sediment delivery to streams from forest roads. While the overall road density is relatively low, a high percentage of the road system is located on relic proglacial lake and inner gorge landforms. These landforms have a high potential to produce mass wasting and surface erosion, and sediment delivery efficiency is also high.

Deep-seated and shallow rapid mass wasting events, surface and gully erosion from roads, and other road-delivered sediment contributes significant amounts of sediment to fish bearing streams.

There are a high percentage of undersized, inadequately spaced, and deteriorated culverts on forest system roads that are located in potentially unstable terrain and have highly erosive soils. Sediment delivery is high on many of these roads due to close proximity to stream channels and channel gradients.

Reducing current sediment inputs by decommissioning roads and improving existing road conditions would move the watershed toward the desired watershed condition classification.

Road Upgrades

Lack of road maintenance and deterioration of existing structures through the years have led to a maintenance backlog. The road system has an increased potential for failures and debris torrents and risk to aquatic habitats. Road upgrading will improve high risk road crossings to meet current BMP's by applying various treatments including replacing culverts, cleaning ditches, installing grade sags to reduce diversion potential, placing additional surfacing to reduce erosion, and removing unstable sidecast.

Aquatic Organism Passage

Culvert fish passage barriers prevent upstream movement of fish and isolate small fish populations in headwaters streams. There are several culverts that block resident fish passage on Pat's Creek and Canyon Creek. These undersized culverts which act as fish barriers are on arterial roads which have fairly large road fills over them, which increase the cost to replace these culverts.

Road Closure/Storage

The objective is to stabilize roads that are high risk to aquatic resources, are not currently needed, but will be needed at some point in the future. The treatments are similar to decommissioning treatments. The road prism will be left in place, but the stream crossings and unstable fill slopes will be removed.

Road to Trail Conversion

The objective is to decommission an existing road to reduce sediment and erosion and maintain access for foot travel and potentially stock. Treatment incorporate decommissioning treatments and construction of a trail to the specified trail management objective standards.

Road Decommissioning

The primary objective when decommissioning an existing road is to reduce road-related erosion or mass wasting and associated sediment delivery into aquatic systems. These roads all have high aquatic risk ratings. Typical work includes; removal of culverts and road fill at all stream crossings, pullback of unstable sidecast fillslope material, outsloping, constructing cross ditches and drainage swales, scarifying the roadbed, placement of logs and other organic matter along excavated slopes, mulching and seeding, and planting with native trees and shrubs.

Unclassified Road Obliteration

Restoration work includes the decommissioning of existing old roads that are not on the Forest Service road system.

Fish Habitat - Large Wood

A 2010 Forest Service habitat survey has identified a severe lack of large key pieces of wood within the mainstem of the Dungeness River. The flood prone areas of the Straights Reach also have very low levels of large wood. The lack of floodplain roughness has allowed the stream to lose sinuosity that has led to the increased gradient of the reach. The increased gradients have caused river channels to incise and become disconnected with floodplains and side channels. The increase in slope and loss of sinuosity has also significantly altered pool and riffle spacing. Because of the size and power of the mainstem river, substantial accumulations of large trees will be needed to begin recreating the stable logjams that historically occurred in this stream. This is not likely to occur in the reasonably foreseeable future without active intervention to provide the necessary woody material from outside the riparian area.

Wildlife Habitat Enhancement

Before forest stands were logged in the 1960s, it is likely that higher elevation stands in the watershed contained natural balds and openings, habitat suitable for the Taylor's checkerspot butterfly. These small gaps were likely a common feature of late-successional forests due to mesic soil conditions, steep rocky soils, high fire return interval, and low timber productivity. Site-scale creation and maintenance of gaps, 1-5 acres in size on balds, meadows, and other forest openings within suitable and occupied Taylor's checkerspot habitat will connect suitable habitat patches with host plants and food resources to support a viable Taylor's checkerspot population, and other species associated with open habitats. Additional habitat projects for species dependent upon dead and dying trees would include augmenting areas with low amounts of downed logs and snags through girdling, and cutting of small or medium-sized trees. Seed collection and cuttings of native plants would benefit numerous species, including pollinators, resident and migratory birds, and ungulates.

Precommercial/Young Stand Thinning

Thinning will achieve objectives to maintain or improve diameter growth rates and prevent height growth stagnation on poorer sites. Work will enhance tree species diversity and height diversity by favoring the protection of existing minor species such as western redcedar, western white pine, silver fir, and some hardwood components within the stand. Work will assist in achieving general ecosystem resource management by providing wildlife forage, cover, and nesting sites; maintaining or improving future large wood long-term recruitment; and improving aquatic habitats and water quality. Adequate road access to the proposed stands will be critical to accomplish the work.

Botanical Area Restoration

Restoration of Botanical Areas would include seed collection and cuttings, native plantings, and invasive weed treatments. Removal of encroaching vegetation to provide habitat to Taylor's checkerspot and other invertebrates would also be included. Restoration activities could also include meadow and wetland enhancement and restoration, including maintenance in earlier projects.

Invasive Plant Treatment

Specific emphasis for invasive plant treatment would include focusing resources on priority species control in priority areas, in both terrestrial and aquatic habitats. Treatment methods would include use of biological, chemical, and manual control specific to targeted priority species. Monitoring invasive species populations and the effectiveness of treatments, along with

prioritizing use of native or desired nonnative species for restoration or rehabilitation in treatment areas would be conducted.

Recreation

The collaborative group brought forward a number of projects that would be considered restoration or repair work. The group also identified future opportunities to improve or increase recreational experiences in the watershed, pending on future NEPA planning efforts and funding.

Repair/restoration actions in the plan include evaluating dispersed recreation site along roads and trails that are directly adjacent to important fish habitat to determine actions that would be needed; repair and restoration of the Lower Dungeness Trail (#833.3); building a trail bridge or ford at the Lower Gray Wolf Trail to connect the Lower and Upper Gray Wolf Trails; reconstruction, removal or repair of the Ned Hill Lookout; replacement of the well at Dungeness Forks Campground; restoring/reconstructing the Gold Creek Shelter; and reclamation of the 2875000 gravel pit (Slab Camp).

Several land acquisitions or easements were also identified, including purchasing or acquiring an easement of the Tubal Caine Mine property within the Buckhorn Wilderness, and purchase of the “Lost Mountain” 50-acre parcel owned by Merrill Ring. These acquisitions would consolidate Forest Service management in the upper reaches of the watershed.

Future opportunities to increase recreational experiences in the watershed include converting the former Eddy Creek road decommission (FS Road 2860000) into a non-motorized trail system; and the larger-scale Trails Study Area that converts a portion of the proposed road decommissions or closures into a non-motorized (hiking, mountain biking, and horse) trail system.

Socioeconomic Impacts

Socioeconomic impacts of the projects are expected to be considerable in the form of local contracting jobs during the implementation phase of projects. Total projected costs of all essential projects in the watershed are approximately \$8 million. This would have a substantial economic impact to the small communities surrounding the watershed. Contracts and work crews would be employed during construction and there would additionally be the long term socioeconomic gains of improving the watershed through protecting fisheries.

Upon completion the projects in this WAP, the four subwatersheds within the Dungeness fifth level watershed will improve several of the watershed condition indicators for the Aquatic Physical, Aquatic Biological and Terrestrial Physical core indicators. The watershed action plan goal is to move watersheds from functioning at risk towards a properly functioning watershed, and to maintain and improve conditions in watersheds that are currently properly functioning.

Dungeness River Watershed Action Plan
Hood Canal Ranger District, Olympic National Forest

Table 4. Overview of 2012 Recommended Restoration Activities, Dungeness Watershed*.

Restoration Activity	Number of Sites	Miles of Activity	Acres of Activity	Estimated Cost for Implementation (does not include NEPA planning, design, contract administration)
Aquatic Organism Passage	5			\$3,000,000
Large Woody Debris Placement	2			\$900,000
Road Closure/Storage	11	13.5		\$578,000
Road Decommission	17	13.8		\$554,000
Road Decommission/Convert to Trail	3	4.6		\$354,000
Road Upgrade	13	54.8		\$1,207,000
Unclassified Road Obliteration	8	8.2		\$190,000
Road Maintenance		82		\$87,500
Native Forage Revegetation		10		\$5,000
Dispersed Recreation Site Rehabilitation	5			\$30,000
Botanical Area Restoration	5			\$38,000
Invasive Weed Treatments			100	\$23,200
Young Stand Thinning			500	\$115,000
Purchase Parcel Owned by Merrill & Ring	1			Fair market appraisal value
Wet Meadow Restoration			10	\$8,000
Snag Creation			300+	\$24,000
Recreation Site Improvement – 2870 Rd	1			\$60,000
Site Reclamation and Restoration – Slab Camp Gravel Pit	1			\$350,000
Well Replacement – Dungeness Forks CG	1			\$25,000
Lower Dungeness (#833.3) Trail Repair and Restoration	3			\$41,000
Trail Reconstruction - former 2860 Rd		3.39		\$200,000
Ned Hill Lookout Historic Structure	1			\$10,000
Gold Creek Shelter Reconstruction	1			\$1,000
Motorized Trail Study Area (Plan only)				\$40,000
Non-Motorized Trail Study Area (Plan only)				\$80,000
Trail Easement – Tubal Caine Mine				Fair market value
Trail Bridge or Ford – Lower Gray Wolf	1			\$250,000
TOTAL		110 miles	990 acres	\$8,170,700

*2016 Update - Some of the projects on this list are complete or nearing completion, such as the AOP projects, whereas other projects such as road maintenance and invasive weed treatment are ongoing activities without a concrete end date. A majority of the precommercial thinning has been completed, but will continue if funding remains available. The Trail Study Area, road-to-trail conversion projects, well replacement, and other future proposed recreation projects that are recommended will be analyzed and updated to reflect changing conditions and management direction. All proposed projects will be analyzed through future NEPA prior to implementation.

RESTORATION ACCOMPLISHMENTS TO-DATE

The Forest continues to complete restoration activities in the Dungeness 5th field watershed which follow recommendations from the Collaborative Group (Appendix A) and the Middle Dungeness 6th field Watershed Restoration Action Plan. Some activities are ongoing, like road maintenance and weed treatment, and some activities are in response to safety and require emergency response, like washouts and landslides. Other activities have been completed as a crucial response to help with anadromous fish passage and wildlife habitat improvement. The Forest will continue to utilize the recommendations of the collaborative group in the planning process and to implement restoration as funding becomes available

Watershed Restoration Accomplishments, 2000-2010

Substantial road treatments have taken place in the Upper Dungeness River subwatershed to remove roads from unstable areas prone to erosion that delivered sediment to trout and salmon habitat. The following is a partial list that highlights benefits to aquatic resources from past projects:

- FS Road 28 Decommissioning – Removed approximately 2.8 miles of road from unstable hillslopes and removed a culvert barrier to rainbow trout on Gold Creek.
- FS Road 2860 Decommissioning – Removed approximately 3.4 miles of road from unstable hillslopes that posed immediate risk of road related sediment delivering to Critical Habitat for Chinook, steelhead, bull trout in the Dungeness River.
- FS Road 2830 Convert to Trail –Removed approximately 5.7 miles of road from unstable hillslopes, and removed culverts barriers to rainbow trout on Gold and Sleepy Hollow Creeks. All fish culvert barriers removed from the Gold Creek drainage after this project.

Past lower watershed/non-National Forest lands Restoration Accomplishments:

- 2015, Canyon Creek Fish Ladder – WA Dept. of Fish and Wildlife constructed a fish ladder to allow salmon, steelhead, and bull trout to pass above the WDFW hatchery intake on Canyon Creek. The fish ladder reconnects approximately 1.5 fish habitat.
- 2008, Lower Dungeness Engineered Log Jams – Jamestown S’Klallam Tribe constructed 7 engineered log jams in the vicinity of the Railroad Park Bridge to improve spawning and rearing habitat for listed threatened fish species.
- See the Habitat Work Schedule, a Washington State website that tracks salmon recovery actions, at <http://hws.ekosystem.us/home> for a more comprehensive list of restoration actions completed in the lower watershed that include estuary, riparian, and instream flow projects.

Current and Planned Restoration Actions:

- 2016, Upper Dungeness Large Wood Enhancement Project – Jamestown S’Klallam Tribe partnering with the Olympic National Forest will be constructed approximately 11 engineered log jams in the Gray Wolf River to improve spawning and rearing habitat for listed Chinook, steelhead, and bull trout.
- Levee setbacks in the lower watershed, plans are in progress to setback or reconfigure the US Army Corps of Engineer levee in the vicinity of the Schoolhouse Bridge.

Terrestrial Restoration Accomplishments, 2012- 2016

Since 2014, 63 acres of Taylor's checkerspot habitat enhancement has been completed through partnerships with U.S. Fish and Wildlife Service, Washington Department of Fish and Wildlife, and Washington Conservation Corps. This includes removing small encroaching trees and shrubs on natural balds and meadows, and removing patches of small trees (mostly Douglas-fir) in young plantations and hand-piling the bucked material. A portion of the work is in Designated Critical Habitat for the checkerspot, and the Three O'Clock Ridge and Tyler Peak Botanical Areas within the Upper Dungeness and Headwaters Dungeness 6th field subwatersheds. This work in Taylor's checkerspot habitat is a priority to move towards species recovery and eventual delisting. An additional 20 acres of enhancing habitat for species associated with balds and open dry meadows besides the Taylor's checkerspot (western bumblebee, butterflies), and early-seral forest habitats was accomplished through removing encroaching vegetation and piling the material to create and enhance openings.

In the Caraco area of the Middle Dungeness 6th field subwatershed, 25 acres of habitat enhancement for wildlife species has been completed which included small gap openings and piling of downed trees, plus weed treatment and seeding of native plants. In the same area, installation of nest boxes for northern flying squirrel account for approximately 52 acres of habitat restoration. In the Canyon Creek area, an additional two acres of slash piling and native seeding was completed.

Over 380 acres of weeds have been treated throughout each of the five 6th field subwatersheds in partnership with the Clallam County Noxious Weed Control Board. The most common weeds treated include Canada thistle, herb Robert, and everlasting peavine. Treated areas included roads (158 acres), rock pits (42 acres), trailheads and campgrounds (74 acres), and unique habitats including Cranberry Bog Botanical Area (23 acres of reed canary grass, Canada and bull thistle, and herb Robert); Pats Prairie Botanical Area (46 acres of Canada thistle), Juniper meadow (4 acres of Canada thistle), and Camp Handy in the Buckhorn Wilderness (17 acres of Canada thistle). Continual invasive plant treatment throughout the watershed is needed, and will exceed the identified acreage in this action plan.

Emphasis in replacing non-native and invasive plants with locally-collected native species has been completed in several subwatersheds, including the Middle Dungeness 5th field subwatershed. Native plant seed collection, cuttings, and plantings were completed at Cranberry Bog Botanical Area (13,000+, *Carex obnupta* plugs and 500+ live willow stakes planted). The botany and native plant program also collected seeds from four key species for pollinators *Aquilegia formosa* (red columbine), *Erigeron philadelphicus* (Philadelphia fleabane), *Geum macrophyllum* (large leaved avens), and *Lupinus rivularis* (riverbank lupine). Maintenance of these unique habitats, and initiating work in new areas will continue.

Since 2012, 457 acres of precommercial thinning has been completed in the Middle Dungeness, Lower Gray Wolf, and Upper Dungeness 6th field subwatersheds. An additional 114 acres in the Jimmycomelately watershed will be completed before roads proposed for decommissioning under this plan are scheduled. Additional precommercial thinning could be done in the watershed exceeding the identified acreage in this action plan.

Recreation Accomplishments, 2012- 2016

The recreation program continues to perform annual maintenance activities on trails and at developed recreation sites. Several kiosks have been replaced along with updated messaging which was developed in partnership with various partner organizations. The recreation program continues to explore options for returning a source of potable water to the area. A new partnership is in the beginning phases of development to address the recreational shooting issues in the area through both clean-up and educational activities. Planning discussions have begun about the possible remodel and expansion of the Tubal Cain Trailhead with the intent of making the trailhead safe for stock trailers and large enough to support the amount of use in the three trails which use this trailhead.

The recreation program has also performed multiple field reconnaissance as to the possibility of a road to trail conversion of FS Road 2860 as proposed by the collaborative group. In the 2012 reconnaissance, it was determined that converting the road to a trail would be an extremely expensive investment which would be hard to maintain the trail to standards which ensure public safety. The crossings themselves were not deemed the issue, but rather the soil type and instability of the slope. Following up on this reconnaissance, a trail counter was placed along the old 2860 over the course of four months in the spring of 2016. A total of 17 users were recorded with several of the users being illegal off road motorized use. In addition to the trail counter, a field report from this same time period reported that the slope has several major slides across the road prism. This confirms the earlier analysis that the proposed road to trail conversion is not a feasible option at this time.

Prepared by:

Susan Piper, Wildlife, Botany, Ecology and Invasive Plant Program Manager, Olympic National Forest, spiper@fs.fed.us, 360-956-2435

Marc McHenry, Fish Biologist, Olympic National Forest, mmchenry@fs.fed.us, 360-765-2231

Scott Hagerty, former Soil Scientist, Olympic National Forest

Dana Butler, Watershed Program Manager, Olympic National Forest, danabutler@fs.fed.us, 360-956-2280

Bob Metzger, Fish Program Manager, Olympic National Forest, rpmetzger@fs.fed.us, 360-956-2293

Reviewing Official: */s/ Dean Yoshina* Date: *September 22, 2016*

Dean Yoshina
District Ranger
Hood Canal Ranger District
Olympic National Forest