USDA
United States Department of Agriculture

Middle Fork Snoqualmie and Pratt Wild and Scenic Rivers Comprehensive River Management Plan

The Middle Fork Snoqualmie River. Photo by Alex Weinberg.

Forest Service **Mt. Baker-Snoqualmie National Forest** **September 2022**

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Contents

Tables

Figures

Introduction

Purpose

This comprehensive river management plan establishes programmatic management direction for the Middle Fork Snoqualmie and Pratt Wild and Scenic Rivers (WSR) on the Mt. Baker-Snoqualmie National Forest. The Wild and Scenic Rivers Act of 1968 requires the Forest Service to develop a management plan to protect and enhance the free-flowing condition, water quality, and outstandingly remarkable values of the Middle Fork Snoqualmie and Pratt Rivers. After completing a river values assessment (Appendix A) the Forest Service identified three outstandingly remarkable values: fish and wildlife for both rivers and, for the Middle Fork Snoqualmie only, recreation. The management plan will guide development, management, and restoration activities in the wild and scenic river corridors. The plan includes standards and guidelines for management of National Forest lands within the river corridor, a visitor use management strategy, and a monitoring plan. The Forest's trust responsibilities to treaty tribes and the requirement to comply with other Federal laws remains unchanged by direction in this plan. The comprehensive river plan implies no jurisdiction over private land or private rights in river corridors, outside the bed and banks of designated rivers.

The 1990 Mt. Baker-Snoqualmie National Forest Land and Resource Management Plan will be amended to incorporate the standards and guidelines for management direction identified in this plan. Implementation of future actions or projects would require appropriate National Environmental Policy Act (NEPA) analysis, documentation, Tribal consultation, and public involvement. This plan will be implemented through three primary mechanisms including intergovernmental coordination, individual agency action, and partnerships with non-governmental organizations and the public. Ultimately its success will depend on community involvement and stewardship.

Cultural Significance of Rivers

The Middle Fork Snoqualmie and Pratt Wild and Scenic Rivers are culturally significant landscapes. Since time immemorial Coast Salish people have been connected to the land and waters, relying on the abundant marine, freshwater and mountain resources for their needs. Families traveled with the seasons in order to harvest plants and animals from places where they thrived. In turn, the indigenous people honored their responsibility to take care of these resources and managed the land through sustainable harvest practices.

The fabric of Coast Salish society is seen across the landscape and waterways of the Snoqualmie watershed. The animals and the various trees and smaller plants furnished many objects in their culture. Today, that connection to the land and water remains strong. Tribes continue to practice sustainable harvests, so that these resources will be available for future generations.

Reserved Treaty Rights

From 1854 to 1855, Territorial Governor Isaac Stevens negotiated multiple treaties with the Indian tribes. Under the 1855 Treaty of Point Elliott, important tribal rights were reserved to maintain livelihood and culture. These reserved rights to natural resources and lands extend far beyond the boundaries of the reservations. Provisions of the treaty ensured tribes could continue to fish at all usual and accustomed places, and to hunt and gather on all open and unclaimed

lands. National forests such as the Mt. Baker-Snoqualmie National Forest are ‘open and unclaimed’ lands on which the tribes reserved treaty rights to hunt and gather.

Treaty rights encompass more than an ability to gather, hunt, or fish. The role of tribes in stewardship on the national forest is crucial to restoring, sustaining, and protecting the integrity of lands and resources, vital to the indigenous peoples’ lifeways. In partnership with the U.S. Forest Service, tribes contribute traditional knowledge, technical expertise, and funding to restore and manage indigenous biomes for the long-term ecological health and resilience of these public lands.

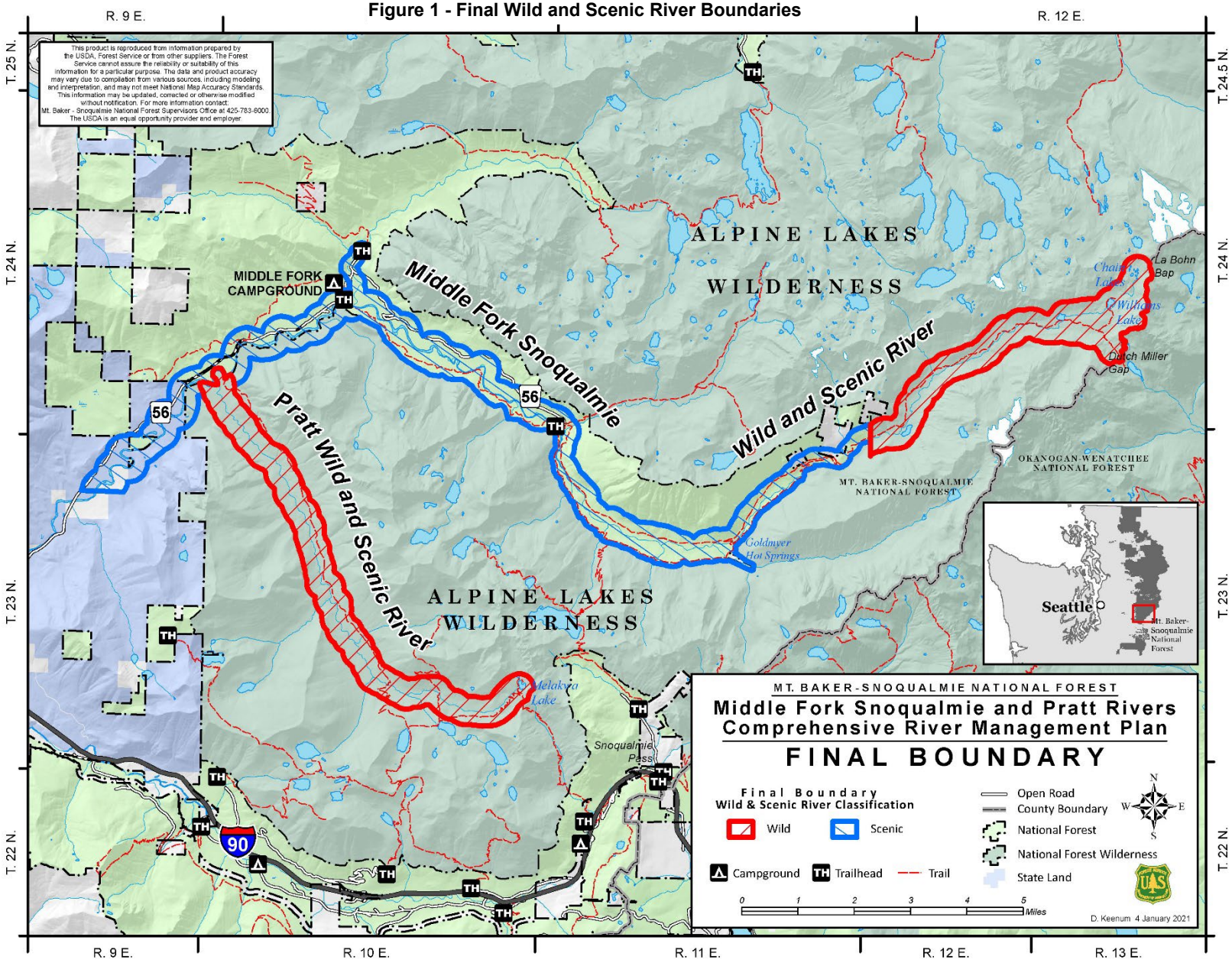
The Federal Trust Relationship

The signing of the treaty demonstrates that the United States recognizes Indian tribes as sovereigns. Treaties, the supreme law of the land under the U.S. Constitution, are contracts between sovereign nations. Correspondence between then President Franklin Pierce and then territorial Governor Isaac Stevens acknowledges that further, where Pierce directs Stevens to ‘treat’ with the Indians in order to extinguish their claim to the land and legitimize existing settlements. Agreeing to secure their homes to the spot, the Indians were promised the right of continuing to travel on the lands and waters to hunt fish and gather as they always had.

Treaty reserved rights are protected under the U.S. Constitution. The 1855 Treaty of Point Elliott outlined the rights “further secured” to the signatory tribes, simultaneously creating a fiduciary relationship between the United States government and tribes. One fundamental component of that relationship is meaningful, legally mandated government-to-government consultation with tribes. The Forest Service has the federal trustee’s responsibility to have meaningful and ongoing consultation with treaty tribes on all potential and immediate impacts to treaty resources.

Under the trust responsibility, federal agencies have a legal obligation to ensure the protection of tribal treaty resources and treaty rights. The trust responsibility applies to federal agency decision-making under the National Environmental Protection Act (NEPA). Management of the Middle Fork Snoqualmie and Pratt Wild and Scenic Rivers will honor the federal trustee’s responsibility to protect and recover tribal treaty resources and treaty rights, and to work with the treaty tribes as co-managers of the resources. Project-specific consultation with the following tribes was invited during the development of this plan: Muckleshoot Indian Tribe, Tulalip Tribes, Puyallup Tribe of Indians, Yakama Nation, Snoqualmie Indian Tribe, and Confederated Tribes of the Colville Reservation. Tulalip Tribes of Washington and Snoqualmie Indian Tribe have consulted throughout the development of the draft plan.

Figure 1 - Final Wild and Scenic River Boundaries



River Designations and Classifications

A portion of the Middle Fork Snoqualmie River and the entire Pratt River were designated by Congress as Wild and Scenic Rivers within the Carl Levin and Howard P. "Buck" McKeon National Defense Authorization Act for Fiscal Year 2015 (P.L. 113-291 - Dec. 19, 2014). The designated areas include the upper 28.3 miles of the Middle Fork Snoqualmie River, beginning at its headwaters near La Bohn Gap and the 10.1 miles of the Pratt River from its source at Melakwa Lakes to the confluence with the Middle Fork Snoqualmie River.

Congress classified segments of the Pratt and Middle Fork Snoqualmie as "wild" and "scenic" (Table 1). As defined in Section 2(b) of the Wild and Scenic Rivers Act (the Act), classifications are defined as follows.

- **Wild River:** A river or segment of a river that is free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- **Scenic River:** A river or segment of a river that is free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- **Recreational River:** A river or segment of a river that is readily accessible by road or railroad, that may have some development along its shorelines, and that may have undergone some impoundment or diversion in the past.

Table 1 - Description and classification of designated river segments

Designated Segment	Classification	River Miles*	Description
Middle Fork Snoqualmie River	Wild	6.9	Headwaters of the Middle Fork Snoqualmie River near La Bohn Gap to the Alpine Lakes Wilderness boundary at the west section line of sec. 3, T. 23 N., R. 12 E.
Middle Fork Snoqualmie River	Scenic	21.4	Alpine Lakes Wilderness boundary at the west section line of sec. 3, T. 23 N., R. 12 E., to the northern boundary of sec. 11, T. 23 N., R. 9 E. The lower terminus is located approximately 0.5 river miles upstream from the bridge on National Forest System (NFS) Road 56, near the confluence of Granite Creek and the Middle Fork Snoqualmie River.
Pratt River	Wild	10.1	Entirety of the river from the outlet of Lower Melakwa Lake to confluence of Middle Fork Snoqualmie River

*River miles are estimated by GIS and may vary overtime.

River Corridor Boundaries

The Act directs river-administering agencies to develop final boundaries to ensure that river values are protected and enhanced. Section 3(b) of the Act provides that the final boundaries shall average not more than 320 acres per river mile, as measured from the ordinary high-water mark on both sides of the river. Private or non-federal lands may be included within the drawn corridor, as per Interagency Wild and Scenic Rivers Council recommendation, although the designation

does not change jurisdiction over those lands. County or state regulations will continue to govern activities on non-federal lands. Forest Service review is required for federally-assisted proposals within the bed and banks of designated rivers, per Section 7 of the Act. An interdisciplinary team of resource specialists determined the boundary based on resource concerns and input from the public. The final boundary includes adjustments to the interim boundaries as described below and shown in Figures 2 and 3.

Middle Fork Snoqualmie River Boundary Adjustments

The Middle Fork Snoqualmie river final WSR boundary contains 8,527.22 acres, including 2,509.34 acres in the wild section and 6,017.9 acres within the scenic section.

Wild Section Adjustments: Inclusion of the entirety of the headwaters from Chain Lakes at La Bohn Gap along the ridgeline to Dutch Miller Gap. This adjustment recognizes the hydrological function of the headwaters for protecting water quality and quantity.

Scenic Section Adjustments: The wild and scenic river boundary along the southern shore of the river will expand or contract to follow the Alpine Lakes Wilderness boundary while the northern boundary will remain offset for ¼ mile from high-water until the boundary reaches the Taylor River (at the west section line of Sec. 22, T. 24 N., R. 10 E.). The boundary extends up the Taylor River approximately 1.25 river miles with a 1/8 mile offset on both sides of the river. Downstream of the Taylor River, the boundary resumes a ¼ mile offset from both sides of the river to the terminus of the wild and scenic river designation at the northern boundary of Sec. 11, T. 23 N., R. 9 E. The boundary near the lower terminus was expanded to include the floodplain and incorporate two remnant oxbows at the S.W. corner of Sec. 36 T. 24 N. R. 9. E. and the S.E. corner of Sec. 35 T. 24 N. R. 9 E.

The interdisciplinary team found that the wilderness designation sufficiently protects river values and in most cases the wilderness boundary is above the floodplain. Making the wild and scenic river and wilderness boundary coincident will assure seamless management across the landscape. Where the floodplain overlaps the wilderness boundary, the river boundary is drawn as an offset to encompass any area that the river may occupy in the future. The boundary includes the private parcel containing Goldmyer Hot Springs. The hot springs were found to be a regionally unique feature and support the rationale for recreation as outstandingly remarkable value of the Middle Fork Snoqualmie. As one of the major tributaries of the Middle Fork Snoqualmie River, the Taylor River is an important source of cold water and trout habitat. The lower Taylor River also includes important goat winter range. Recreation amenities along the Taylor River are an integral part of the visitor experience and are linked to major access points along the Middle Fork Snoqualmie. The lower 1.2 miles of the Taylor River tributary is included in the final boundary because of its importance for water quality, fish, wildlife, and recreation values.

Pratt River Boundary Adjustments

The final Pratt river corridor includes 3,133.1 acres. The boundary adjustment for the Pratt River extended the upland terminus to ¼ mile from the origin of the river at outlet of Lower Melakwa Lake. The ¼ mile buffer includes the Lower and Upper Melakwa Lakes and is bounded on the east by the hydrological divide between the Pratt River drainage and Denny Creek drainage. The boundary at the downstream terminus follows the Alpine Lakes Wilderness boundary along the Middle Fork Snoqualmie River. The extension of the terminus at the headwaters recognizes the importance of water quality in Melakwa Lakes in relation to the Pratt River.

Figure 2 - Proposed Boundary Changes Map 1 of 2

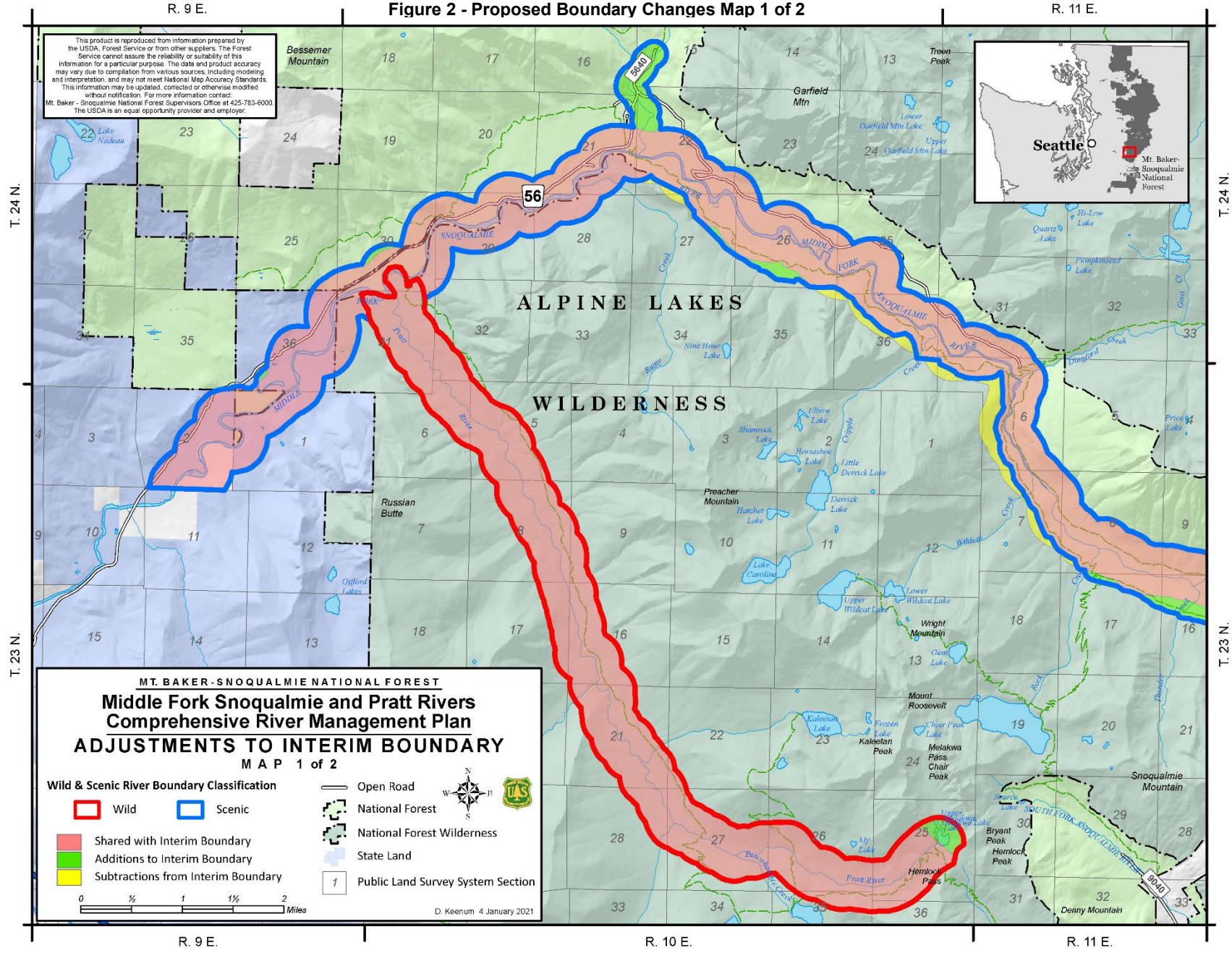
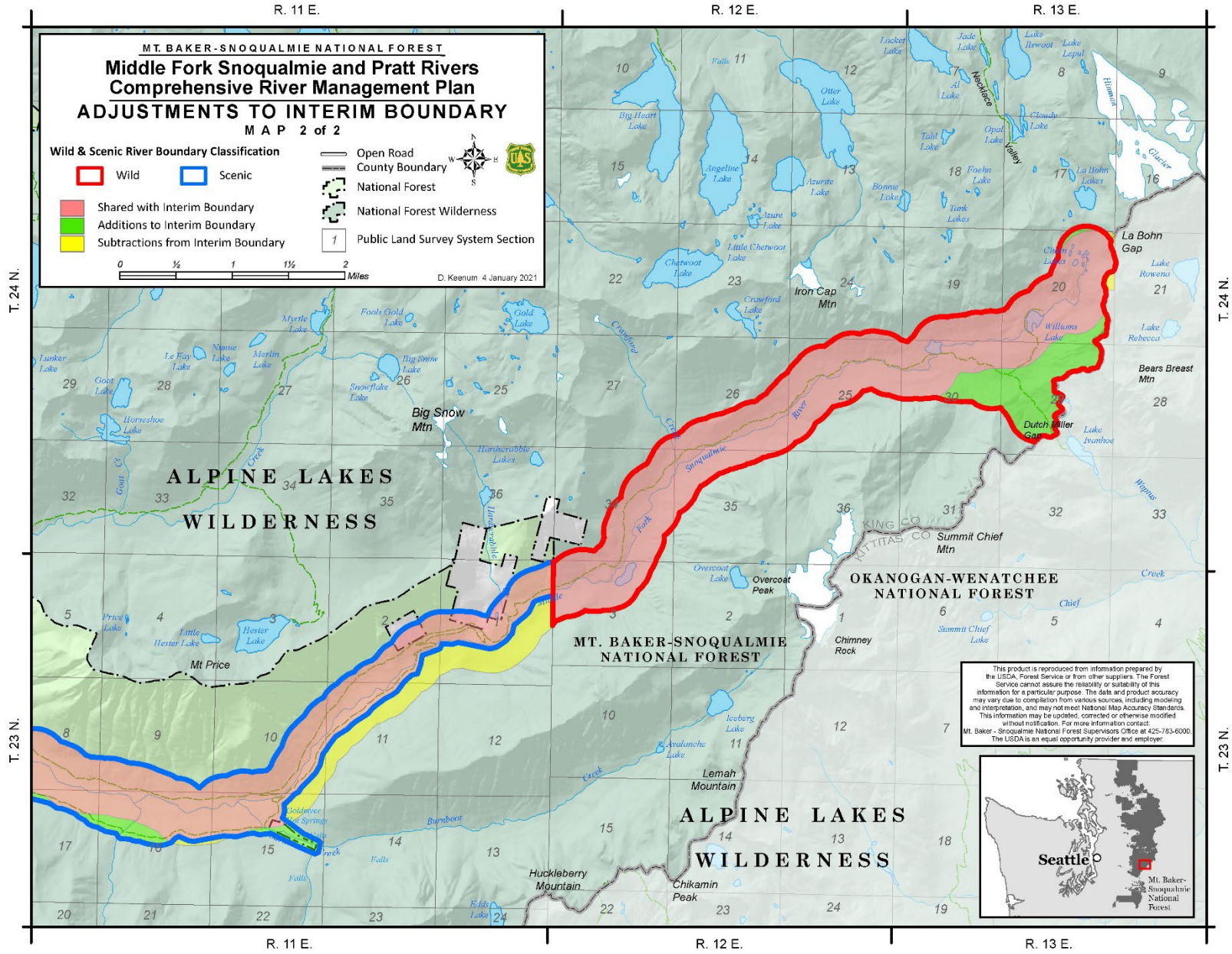


Figure 3 - Proposed Boundary Changes Map 2 of 2



Agency Responsibilities and Authorities

The following summarizes responsibilities and authorities of various agencies relative to activities within the wild and scenic river corridors.

Figure 4 - Sign at entrance to Middle Fork Snoqualmie River Valley

Federal Agencies

The U.S. Forest Service (USFS) manages all National Forest lands. The Forest Service is the agency charged with administering the Middle Fork Snoqualmie and Pratt Wild and Scenic Rivers and provides the determination of effects to the free flow, water quality, and outstandingly remarkable values for any water resources project as described in Section 7 of the Wild and Scenic Rivers Act. The Forest Service has a legal obligation to ensure the protection of Tribal treaty resources and treaty rights within the river corridors, and beyond.

The U.S. Army Corps of Engineers regulates, through permits, the discharge of dredged or fill material into rivers and wetlands of the United States. The Corps also regulates structures and work in navigable waters. U.S. Army Corps permit applications for activities in Wild and Scenic Rivers are subject to the provisions of Section 7 of the Wild and Scenic Rivers Act. The Bureau of Land Management manages locatable mineral claims on federal lands.

State Agencies

Washington Department of Ecology carries out the federal Clean Water Act for the state and is responsible for water quality standards, assessment, and regulation. The Department also oversees water rights and protects instream flows. The Washington Department of Fish and Wildlife is responsible for fishing and hunting regulations and is tasked with the recovery of state-endangered, threatened, or sensitive species.

The Washington Department of Natural Resources is responsible for the Middle Fork Snoqualmie Natural Resource Conservation Area lands within the river corridor. The Washington Department of Natural Resources Forest Practices Board sets regulations for forestry on non-federal lands.

Local Agencies

The King County Department of Natural Resources and Parks is responsible for the Middle Fork Snoqualmie Natural Area within the lower reach of the Middle Fork Snoqualmie Wild and Scenic River. The Water and Land Resources Division monitors water quality and benthic macroinvertebrates within the river corridors. King County Noxious Weed Control Program supports invasive species monitoring and eradication in the river corridors. The King County Road Services Division is responsible for maintaining National Forest System (NFS) Road 56/Middle Fork Snoqualmie Road (p. 29).

Baseline Conditions

The Middle Fork Snoqualmie River and its tributary, the Pratt River, are located within the Upper Snoqualmie River Basin of the Snohomish Watershed within Water Resource Inventory Area (WRIA) 7. The watershed supports wild runs of Coho, chinook, pink, chum and steelhead salmon. The Middle Fork Snoqualmie and Pratt Rivers are located above Snoqualmie Falls, a natural barrier to anadromous fish. The Middle Fork Snoqualmie is estimated to supply up to 60% of the flow over Snoqualmie Falls and is considered an important source of cold water for salmon downstream in the watershed.

Figure 5 - The Middle Fork Snoqualmie at the outlet of Williams Lake.

The entirety of the Pratt River corridor and 90% of the Middle Fork Snoqualmie wild and scenic river corridor is within the Mt. Baker-Snoqualmie National Forest. The Washington Department of Natural Resources manages over 680 acres of the 9,024-acre Middle Fork Snoqualmie River corridor as the Middle Fork Snoqualmie Natural Resources Conservation Area. King County Parks manages 97 acres as the Middle Fork Snoqualmie Natural Area. Another 81.2 acres are privately owned inholdings in the upper reaches of the Middle Fork Snoqualmie scenic section. Approximately 22 federal mining claims are active in the upper Middle Fork Snoqualmie valley, roughly half of which are within the designated river corridor. Mining activity in the area is generally concentrated on specimen-quality quartz and other minerals.

Much of the upper watershed is within the Alpine Lakes Wilderness, originally designated in 1976 and expanded to include an additional 22,000 acres in 2014. Logging operations of the early 20th century in both the Middle Fork Snoqualmie and Pratt drainages left impacts on riparian and

upland habitats that can still be seen today. In fact, approximately 35% of the two river corridors now consists of even aged, second-growth stands. The riparian corridors in the Middle Fork Scenic and Pratt River Wild Sections were intensely harvested in the last century (Figure 8) and these forested areas will not reach maturity for years and possibly centuries. The impacts to riparian areas from past harvest likely resulted in increased erosion and sedimentation, as well as decreased shade and a reduction in large wood recruitment to the channels. The Middle Fork Snoqualmie River scenic section and the Pratt River are estimated to have wider and shallower stream channels than they may have had in the past. There is less large wood habitat in these reaches causing shallower pools, wider bankfull widths, and less hyporheic exchange.

The historic timber harvest removed late-successional or old-growth forest important to a variety of wildlife species. The second-growth stands that came back in their place tend to have more simplified forest structure that supports a less diverse array of bird and mammal. Outside of those harvested stands, there are remnant patches of the older, more diverse, and naturally regenerated stands that provide the multiple canopy layers, large decadent trees and snags that can serve as nesting, roosting, denning, and foraging habitat or refugia for a variety of bird and mammal species and their prey. Natural openings, such as open shrub-fields and avalanche chutes provide shrubs and herbaceous plants that are browsed by bears and ungulates, provide nectar resources for pollinators, and may include berry producing shrubs that provide food for a variety of birds and mammals. Riparian forests provide important refugia for amphibians and are important foraging areas for birds, bats, bears, and ungulates. Old river channels, beaver ponds, wetlands, small ponds and other water bodies scattered throughout the river corridors provide herbaceous and woody browse for a variety of species, as well as insect prey for bats and birds, and open water foraging areas for aquatic-based wildlife. Despite significant changes to the landscape, as late as into the 1980s, the Middle Fork Snoqualmie and Pratt River watersheds also remained important use areas for tribal members to hunt and exercise their treaty rights. While these lands remain important use areas for tribal members, opportunities to exercise treaty rights, including hunting, have been diminished over time due to the compounding impacts of habitat degradation, development, and increased recreational use of the area.

Over the past three decades, land management in the upper watershed has emphasized restoration and a focus on recreational opportunities. The 2005 Middle Fork Snoqualmie Watershed Access and Travel Management (ATM) Plan Decision Notice included actions designed to help meet watershed restoration objectives and address illegal dumping and unauthorized motorized off-road use within side channels of the Middle Fork Snoqualmie and Taylor Rivers. These actions included decommissioning 30.8 miles of spur roads off NFS Roads 56 and 5640 and removing at least 15 culverts. The Decision Notice also directed that a gate be installed on NFS Road 56 at Dingford Creek and that the remainder of the road be converted to an NFS trail, Dutch Miller Gap Trail #1030, and a private (non-system) road that allows for limited motorized access for authorized private landowners and mining claimants. This section of former roadway is managed as a trail by the Forest and is under an easement for use and maintenance for motorized vehicle access by private landowners (p. 29).

Figure 6 - A paved portion of NFS Road 56. Photo by Monty VanderBilt.

The Federal Highway Administration, Western Federal Lands Highway Division (FHWA), in partnership with the U.S. Forest Service and King County, Washington, improved 9.7 miles of NFS Road 56, also known as the Middle Fork Snoqualmie River Road from milepost (MP) 2.7 to the Middle Fork Snoqualmie River Campground at MP 12.4. Completed in 2017, the project aimed to increase operational safety and reduce maintenance needs of the road while enhancing recreational access to the valley. The project also improved floodplain connectivity, reduced areas of erosion and sedimentation, and improved fish passage. Elevation of the roadway to reduce flood damage resulted in an improved design that would discourage parking along the side of the road, limiting resource damage in riparian areas. As recreation has increased in the valley, Tribal hunting has declined in the Middle Fork Snoqualmie watershed over the last few decades.

The Tulalip Beaver Project is restoring the North American beaver (*Castor canadensis*) populations in the upper Middle Fork Snoqualmie River Valley. The project relocates “nuisance” beavers to suitable habitat within their historic range. Beaver are ecosystem engineers, restoring hydrologic processes and fish habitat, reducing stream temperatures, buffering the effects of flood events, improving flows, and recharging groundwater. This project is led by Tulalip Tribes of Washington. In 2007 Tulalip Tribes signed a Memorandum of Agreement (MOA) with the Forest Service to preserve treaty reserved rights. The relocation of beavers is conducted under this MOA and is done under the tribal sovereignty of the Tulalip Tribes to restore fish habitat within their Usual and Accustomed areas, which encompass the Mt. Baker-Snoqualmie National Forest lands

within Middle Fork Snoqualmie River Watershed. Beaver relocation has also been suggested as a climate change adaptation[1] for their ability to create wetlands that increase water storage.

Figure 7 - A beaver about to be relocated to habitat along the Middle Fork Snoqualmie River.

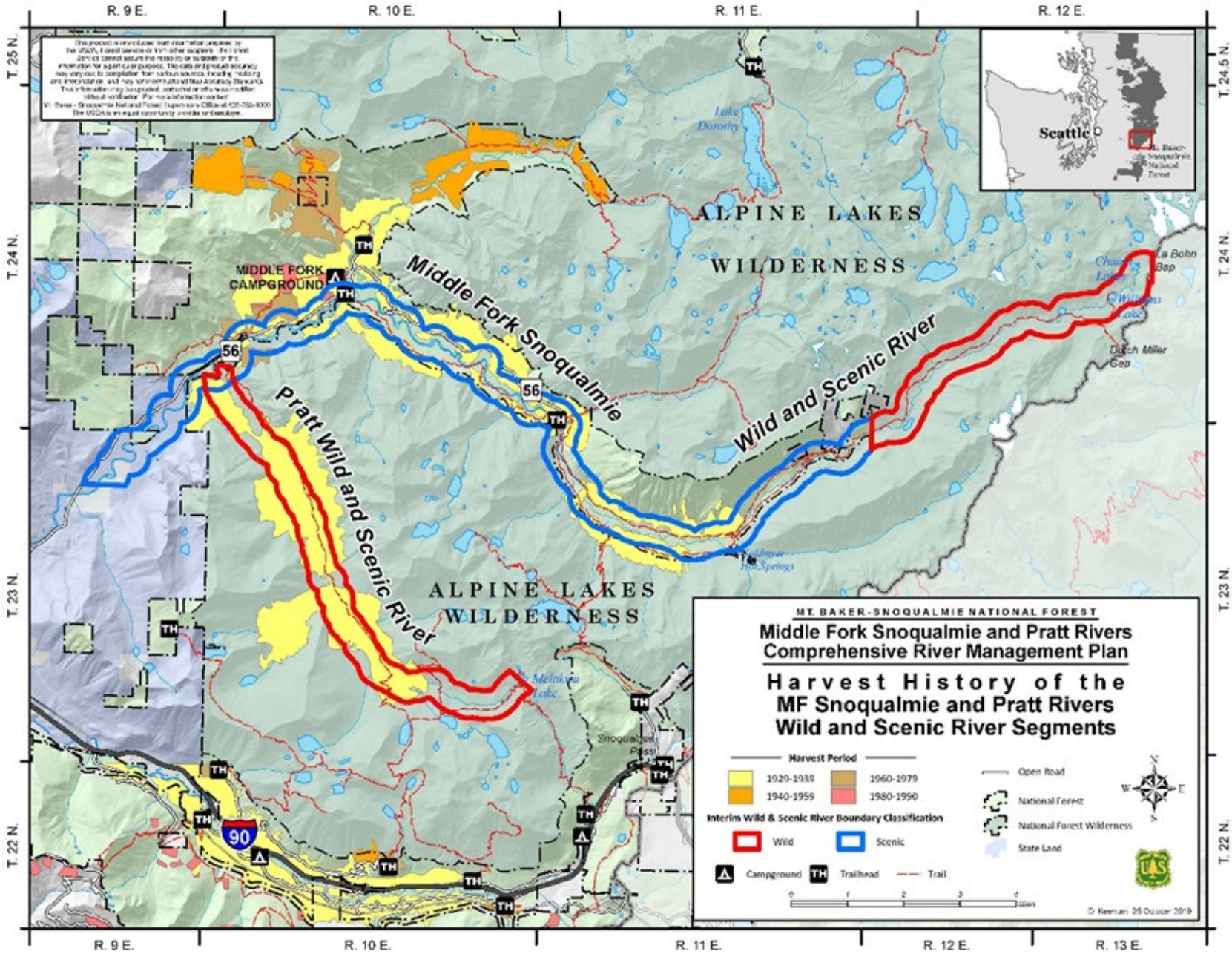
A partnership between Mountains to Sound Greenway Trust, King County Noxious Weed Program, Department of Natural Resources, and the Forest Service has monitored and treated invasive plant species along trails, roads, and river corridors in the Middle Fork Snoqualmie River Valley since 2006. Additional restoration work and recreation maintenance is conducted regularly by crews and volunteers with the Mountains to Sound Greenway Trust.

Riparian systems such as those in the Middle Fork Snoqualmie and Pratt river corridors will have an even more important role for wildlife under climate change scenarios. These riparian corridors connect habitats and ecological zones across elevational gradients, linking the aquatic portions of the wild and scenic rivers to the terrestrial habitat and upland areas, providing thermal refugia as a buffer against extreme temperatures (E.g., record-setting heat wave in 2021), and the natural resilience of riparian systems overall[2].

[1] Lawler, J.J., C.L. Raymond, M.E. Ryan, M.J. Case, and R.M. Rochefort. 2014. Chapter 6: Climate Change, Wildlife, and Wildlife Habitat in the North Cascade Range. Pages 177-234 IN Raymond, C.L.; D.L. Peterson; and R.M. Rochefort, eds. Climate change vulnerability and adaptation in the North Cascades region, Washington. Gen. Tech. Rep. PNW-GTR-892. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 279 p.

[2] Seavy, N.M., T. Gardali, G.H. Golet, F.T. Griggs, C.A Howell, R. Kelsey, S.L. Small, J.H. Viers, J.F. Weigand. 2009. Why Climate Change Makes Riparian Restoration More Important than Ever: Recommendations for Practice and Research. Ecological Restoration 27:3.

Figure 8 - Estimated harvest history of the Middle Fork Snoqualmie and Pratt WSR Corridor



Free Flow

The Wild and Scenic Rivers Act directs the Forest Service to protect and enhance the free-flowing condition of designated rivers. Free-flowing condition, as defined in Section 16(b) of the Wild and Scenic Rivers Act, means:

> *"...existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway. The existence, however, of low dams, diversion works, or other minor structures...shall not automatically bar its consideration for inclusion..."*

The entire designated lengths of Middle Fork Snoqualmie and Pratt Rivers, which contain no dams, diversion structures, significant channeling or other modifications, or excessive rip-rapping, are considered free-flowing. However, NFS Road 56 may impact floodplain function and potential for riparian regrowth along certain stretches within the scenic section of the Middle Fork Snoqualmie River. From aerial imagery, it is estimated that approximately 0.5 river miles are impacted along the paved stretch of the road.

In addition to these known channel hardening locations, there is also smaller, more localized streambank hardening and relief culverts along the section of Dutch Miller Gap Trail #1030 that occupies the former NFS Road 56. There are numerous trail bridges in the Alpine Lakes Wilderness that support recreation in the Middle Fork corridor. These bridges are not constructed with abutments that impact the active channel or 100-year floodplain.

There are no roads, trail bridges, or homes along the Pratt River and only a few dispersed campsites along the Pratt River Trail. The hydrology of this river is intact with no impervious surfaces.

Water Rights & Instream Flows

The designation as a WSR "shall not be construed as a reservation of the waters of such streams for purposes other than those specified in the Act, or in quantities great than necessary to accomplish these purposes" (Section 13(c)). The Act permits the reservation of a federal water right to some or all the instream flows as necessary to protect and enhance river values. Aside from one water supply permit held by the U.S. Forest Service since the 1950s, there are no known active or pending water rights on the designated sections of the Middle Fork Snoqualmie or Pratt Rivers or their tributaries. Washington Department of Ecology has not established minimum instream flows for the Middle Fork Snoqualmie or Pratt Rivers. As most of the watershed draining to these rivers is managed by the Forest Service, it is not necessary to claim a federal reserved water right for these rivers.

Water Quality Conditions

The Middle Fork Snoqualmie River is in exceedance of state standards for water temperature. High water temperature can be lethal or stressful to fish and other aquatic organisms and may create or exacerbate other water quality problems such as low levels of dissolved oxygen. Beneficial uses, applicable standards and associated water bodies for the Middle Fork Snoqualmie and Pratt River Wild and Scenic River corridors (adapted from WAC 173-201a) are listed in Appendix B. Waters that do not meet state standards are deemed water quality limited by the Washington State Department of Ecology (DOE). The DOE lists water quality limited bodies on the 303(d) list and establishes a Total Maximum Daily Load (TMDL). TMDLs determine total

acceptable levels of degradation for a specific waterbody to meet water quality standards and recommendations for future management actions to improve temperature in the basin. River segments listed in the Snoqualmie River Watershed Temperature TDML within and adjacent to the Middle Fork Snoqualmie and Pratt Rivers are displayed in Table 2 and Figure 9.

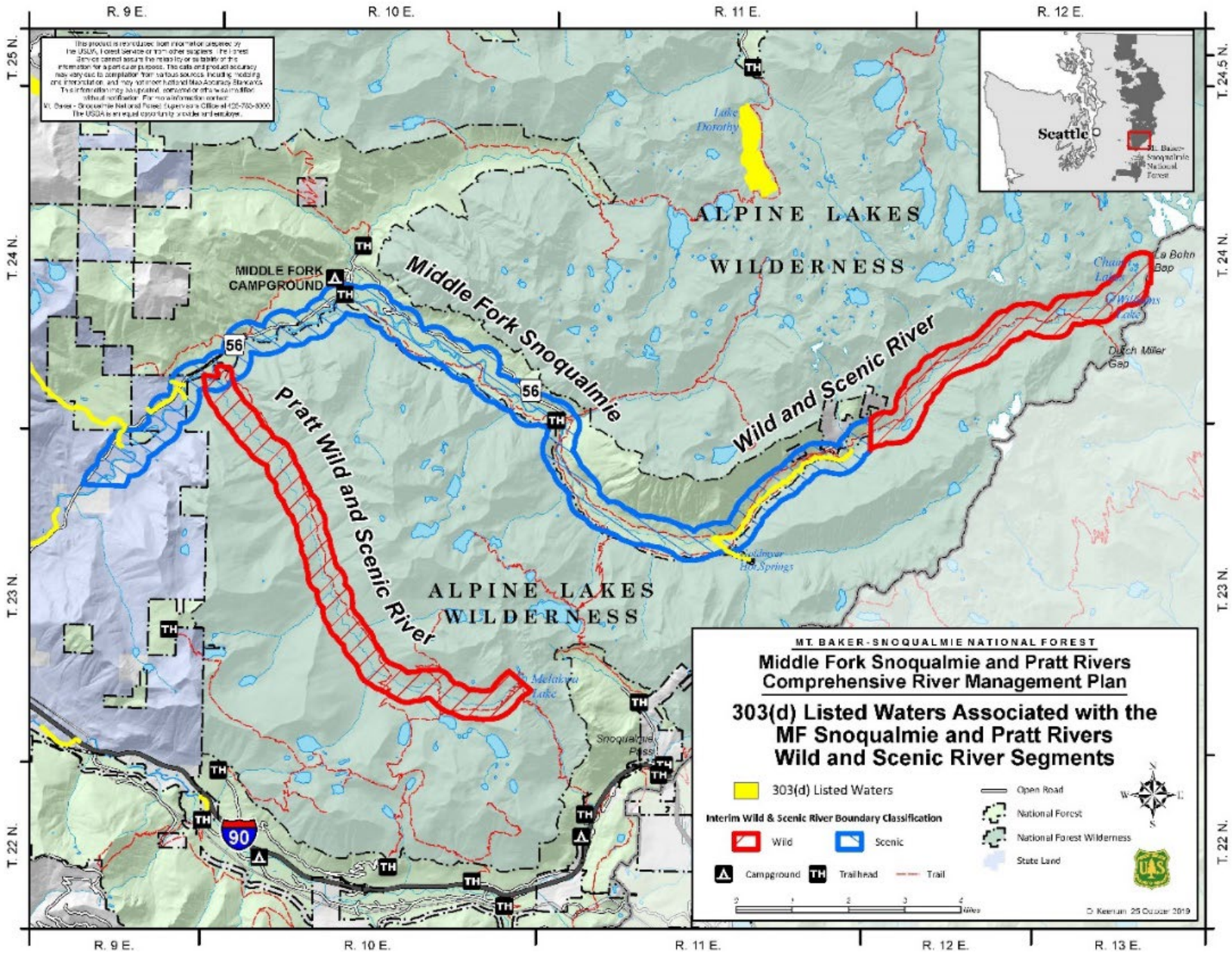
Table 2 - State of Washington 303(d) listed waters within the watersheds draining the Middle Fork Snoqualmie and Pratt River Wild and Scenic River corridors.

Impairment Listing #	Stream Name	Impairment Category (TMDL in place)	Miles
72540 (Temperature)	Unnamed Tributary to MF Snoqualmie	4A	3.0
72553 (Temperature)	Burnboot Creek	4A	2.3
72554 (Temperature)	Middle Fork Snoqualmie River	4A	9.8
72556 (Temperature)	Kimball Creek	4A	0.8
72557 (Temperature)	Unnamed Tributary to MF Snoqualmie	4A	10.1

Water quality monitoring conducted by the King County Department of Natural Resources and Parks, Water and Land Resources Division (KCDNR), has found temperatures exceeding state standards on a regular basis in multiple reaches of the Middle Fork Snoqualmie River. Additional monitoring (since 2018) at the mouth of the Pratt River also shows exceedance of state water quality standards. The Snoqualmie Science Coordination and Advisory Team (SnoSCAT), a multi-agency collaborative group, is actively investigating temperature issues on the Middle Fork Snoqualmie. The Forest Service, National Oceanic and Atmospheric Administration (NOAA), and KCDNR have been continuously monitoring water temperature in the Middle Fork since 2012. This data has been used to develop a statistical stream temperature model for the Snoqualmie basin. The modeling predicts that the Snoqualmie watershed will shift from a mixed rain and snow dominated watershed more towards a rain dominated system. Less precipitation falling as snow is expected to cause a decrease in summer flows and an increase in summer stream temperatures (Lee et al., 2020). In addition to temperature modeling, modeling has been done on potential treatments and how they might be used to enhance snow retention and snow water storage in order to combat high in-stream water temperatures in the future (Yan and Sun 2020).

Water quality in Williams Lake in the headwaters of the Middle Fork Snoqualmie River has been found to contain toxic concentrations of copper according to a 1987 report cited in the Middle Fork Snoqualmie Watershed Analysis (1998). When the Forest Service acquired the lands containing the former copper mine at La Bohn Gap in the 1990's, it was not known whether copper levels were naturally occurring in the lake or the result of prior mining activity. No additional monitoring has occurred, and no future mining is expected to occur at this site.

Figure 9 - Location of impaired waters related to stream temperatures



Outstandingly Remarkable Values

Rivers designated by the Act possess outstandingly remarkable values that may include one or more of the following: "scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values" (Section 1(b)). In order to be assessed as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant at a comparative regional or national scale. Dictionary definitions of the words "unique" and "rare" indicate that such a value would be one that is a conspicuous example from among a number of similar values that are themselves uncommon or extraordinary. The Middle Fork Snoqualmie River was found to possess outstandingly remarkable values for fish, wildlife, and recreation and the Pratt River was found to have outstandingly remarkable values for fish and wildlife.

Under no circumstance does the "outstandingly remarkable value" of another resource identified in this plan outweigh the importance of federally protected Tribal rights, and the Forest Service's trust obligations to protect those rights. The cultural values assigned to the rivers and resources in the Middle Fork Snoqualmie Valley by Tribal members transcend categorization and evaluation.

Fish Values

The presence of wild resident cutthroat trout and their genetic diversity are outstandingly remarkable on the Middle Fork Snoqualmie and Pratt Rivers. Fish in these rivers have been cut-off from the downstream watershed since the last Ice Age due to the presence of Snoqualmie Falls, a barrier to anadromous fish. The Middle Fork Snoqualmie River (and the Pratt River, its tributary) are managed as a wild trout resource by Washington Department of Fish and Wildlife. DNA analysis of the coastal cutthroat trout showed subpopulations to be genetically distinct in the main stem and tributaries of the Middle Fork Snoqualmie River. The relatively high levels of genetic diversity are expected to allow greater adaptability to changing environmental conditions.

Fishing is a popular recreational activity in the Middle Fork watershed in both the rivers and lakes. Washington Department of Fish and Wildlife and area Tribes co-manage the fisheries in the state. With a history of stocking non-native species, the Middle Fork Snoqualmie River is currently managed as a wild trout resource with a year-round catch-and-release fishery[3] and genetic analyses showed both the composition and distribution of trout in the Middle Fork mainstem to be dominated by native coastal cutthroat[4] with subpopulations that were genetically distinct in the mainstem and tributaries as well as from other South Puget Sound cutthroat trout.[5]

Many of the lakes in the Middle Fork Snoqualmie and Pratt River drainages are currently stocked with non-native rainbow trout, brook trout, and cutthroat trout. However, they are stocked in

[3] Thompson J.N., J.L. Whitney, and R.E. Lamb. 2011b. Snoqualmie River Game Fish Enhancement Plan: Final Report of Research. Prepared for Puget Sound Energy. Washington Department of Fish and Wildlife. Mill Creek, WA.

[4] Thompson, J.N., M.P. Small, and C. Dean. 2011a. Genetic composition of Pacific trout species in relation to landscape features in the upper Snoqualmie River watershed, Washington. Appendix 3 in Thompson et al. 2011. Snoqualmie River Game Fish Enhancement Plan: Final Report of Research. Prepared for Puget Sound Energy. Washington Department of Fish and Wildlife. Mill Creek, WA

[5] Latterell, J.J. 2001. Distribution constraints and population genetics of native trout in unlogged and clear-cut headwater streams. M.S. Thesis, University of Washington. Seattle, WA.

areas where they are considered functionally sterile, where spawning habitat is either not present or is not suitable during the spawning period.[6]

Wildlife Values

Wildlife is an outstandingly remarkable value of the Middle Fork Snoqualmie and Pratt Rivers. The original 1990 river values assessment concluded that the riparian habitat and winter range in this area are extensive and have great importance for a variety of associated species, including elk, deer, mountain goats, black bears, beaver, and other furbearers. More recent assessments identified the river-dependent harlequin duck as a species of concern. The river corridors provide critical refugia and essential cross-elevational riparian habitat to these species given projected climate change impacts. The proximity of these river corridors to a large urban center provides both an exceptional opportunity for education and interpretation as well as a threat to the viability and integrity of riparian habitats and dependent species. These combined factors make this riparian habitat and these species unique and notable within the region of comparison.

Recreation Values

Recreation is an outstandingly remarkable value of the Middle Fork Snoqualmie River because of the diversity of year-round opportunities both on and next to the river. The Middle Fork Snoqualmie offers opportunities for catch and release fishing year-round, including fishing for resident cutthroat trout, where many other trout runs in the North Cascades are closed seasonally due to the presence of anadromous fish. The river provides exceptional beginner-level whitewater opportunities with scenic mountain views. Access for equestrians is considered exemplary in the region of comparison. Goldmyer Hot Springs, located on private land within the National Forest on the Burntboot Creek tributary, attracts visitors from all over the world. The hot springs are not only regionally uncommon but are also unique in form, as they flow from a horizontal mine shaft where visitors soak in a cave-like setting. The valley's low elevation allows for year-round recreational access and the proximity to a major metropolitan area and accessibility by paved road are notable within the region of comparison.

For detailed descriptions of visitor use and current conditions, see the Visitor Use Management section (p. 29). Additional information about free-flow condition, water quality, and the outstandingly remarkable values is available in the river values assessment prepared in 2019 (Appendix A).

Management Direction

Management direction on the Mt. Baker Snoqualmie National Forest comes from the 1990 *Mt. Baker-Snoqualmie National Forest Land and Resource Management Plan* (Forest Plan), as amended by the 1994 *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl* (Northwest Forest Plan). These two documents guide planning on the forest through the categorization of land allocations (known as Management Areas) across the Forest, and each management area category contains prescribed standards and guidelines. Standards and guidelines are intended to

[6] Spinelli, J. 2019. Fisheries Biologist, Washington Department of Fish and Wildlife. E-mail to Karen Chang, Fisheries Biologist, Mt. Baker-Snoqualmie National Forest, on 10/28/2019 re: stocking of high elevation lakes.

help the manager achieve the goals and objectives, while staying within constraints prescribed by law. There are two categories of standards and guidelines: Forest-wide, applying to all management areas; and those specific to individual management areas. The original Forest Plan did not include a management area specific to designated wild and scenic rivers, only potential wild and scenic river management areas.

A new management area, including standards and guidelines specific to congressionally-designated wild and scenic rivers, was developed as a part of the planning process for the Middle Fork Snoqualmie and Pratt Wild and Scenic River. This new management area will be applied to areas within the final Middle Fork Snoqualmie and Pratt River Wild and Scenic River Boundaries to ensure that Wild and Scenic River values are protected. Additional Forest Plan amendments would be required to apply this management area to other designated wild and scenic river corridors.

Management Area Direction: Designated Wild and Scenic River (MA-28)

This management area applies to river segments that are designated for inclusion as part of the wild and scenic river system under the authority granted by the Wild and Scenic Rivers Act of 1968, as amended. Wild and scenic river segments are classified as wild, scenic, or recreational.

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

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

- Recreational river segment— 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.

Desired Future Conditions

Desired conditions are a description of the specific social, economic, and/or ecological characteristics of an area toward which the management of the area should be directed.

1. The free flowing condition, water quality and specific outstandingly remarkable values of designated wild, scenic, and recreational rivers are protected or enhanced.

2. Wild classified wild and scenic rivers are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.

3. Scenic classified wild and scenic rivers are free of impoundments, with shorelines or watersheds still largely primitive and undeveloped but accessible in places by roads.

4. Recreational classified wild and scenic rivers are readily accessible by road or railroad and may have some development along their shorelines but the shoreline and surrounding area should be predominantly natural and riverine in appearance.

5. Administrative facilities on designated wild and scenic rivers are screened or designed to blend into the natural river environment and development is consistent with the river's classification.

6. Management is consistent with a current comprehensive river management plan.

7. Public recreation and resource uses are provided that do not adversely impact or degrade the values for which the river was designated.

Standards

Standards are mandatory constraints on projects and activity decision-making established to help achieve or maintain the desired conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements.

1. Designated rivers must be managed to protect the free-flowing character, water quality, and outstandingly remarkable values for which they were designated.

2. Wilderness management direction must be followed where segments of designated rivers are located in congressionally designated wilderness areas.

3. Road and motorized trail access to rivers must be consistent with river classification and travel management direction.

4. If new recreation facilities are needed, they should be consistent with river classification and scenic integrity objectives and located to protect the river's free-flowing condition, water quality, and outstandingly remarkable values.

5. Proposed water resources projects, including activities within the bed and banks and below the ordinary high water mark of the river, require an evaluation for direct and adverse effects to river values per Section 7(a) of the Wild and Scenic Rivers Act and cannot result in a direct and adverse impact on free-flowing condition.

6. All operations authorized under the 1872 Mining Law shall be conducted so as, where feasible, to minimize environmental impacts on National Forest surface resources; including provisions to maintain streamside banks in a natural condition.

7. For river segments designated as recreation or scenic a no-surface occupancy stipulation shall be required in mineral leases. Operation plans will include provisions to maintain streamside banks in a natural condition.

8. Salable mineral activities shall not occur in the bed and banks of recreation or scenic rivers but may occur within river corridors only if objectives for the protection of river values can be met.

Guidelines

Guidelines are constraints on project and activity decision-making that allows for departure from its terms, so long as the purpose of the guideline is met.

1. Where the deficiency of complex habitat is considered a limiting factor for water quality and other river values, riparian management and aquatic restoration should favor

conditions that facilitate the return of natural processes and habitat improvement, including placement of large woody debris and the reintroduction of beavers.

2. Where the river erodes roads, trails, or other developed features along the shoreline, these features should be relocated, when feasible, out of the floodplain and away from important habitat areas.

3. In areas where existing critical infrastructure is threatened by erosion but relocation out of the floodplain is not possible, any necessary river bank restoration should be implemented through the installation of soil reinforcements as necessary to support riparian vegetation; planting or installing large wood and native trees, shrubs, and herbaceous cover as necessary to restore ecological function in riparian and floodplain habitats; or a combination of the above methods. Rock should be used sparingly for riverbank restoration, except as ballast to stabilize large wood.

4. Within the Middle Fork Snoqualmie River scenic corridor, where mountain goat habitat features exist near the Taylor River, trails and campsites within 1,500 feet of known key habitat features should be discouraged. There shall not be motorized use October 31 - June 15 nor shall new roads be constructed within 1,500 feet of key mountain goat habitat features. Key habitat features characteristically contain diverse vegetation including mature and old growth stands, steep rocky cliffs, projecting pinnacles, ledges and talus slides winter range is generally at lower elevations (tree-line and below) than summer habitat.

5. Management activities should be consistent with the scenic integrity objectives of:

    a. “Very high” in designated wild rivers,

    b. “High” in designated scenic rivers, and

    c. “Moderate to high” in designated recreational rivers.

6. Where visitor use and associated infrastructure is considered a limiting factor for wildlife values, management techniques that limit or constrain visitor use and facilitate the recovery of affected species should be favored.

Suitability of lands

Suitability of lands is a determination that specific lands within a plan area may be used, or not, for various multiple uses or activities, based on the desired conditions applicable to those lands.

1. Wild river corridors are not suitable for timber production or for commercial use of non-timber forest products; timber harvest is not allowed.

2. Scenic and recreational river corridors are not suitable for scheduled timber production; however, timber harvests, salvage and fuelwood cutting may be utilized to achieve desired riparian conditions consistent with the Aquatic Conservation Strategy, including wildlife habitat connectivity. Scenic river corridors are suitable for non-commercial (personal) use of non-timber forest products.

3. Recreational river corridors are suitable for the commercial and non-commercial (personal) use of non-timber forest products.

Desired River Conditions

Desired river conditions for the wild and scenic rivers describe resource conditions, visitor experiences and opportunities, and facilities and services that the Forest Service should strive to achieve and maintain within the river corridors. The desired river conditions present a broad vision of the desired state for resources in the river corridor, and the standards and guidelines provide more detailed management direction. Actions that lead toward the desired conditions over the long term would be considered consistent with this plan. Actions that lead the corridor away from desired conditions over the long term would be considered inconsistent with this plan. While it may not be possible to anticipate every potential future use, discussion of desired conditions is intended to provide additional clarification on how to interpret standards and guidelines if conflicts arise.

Free-flowing condition

The quantity and timing of water flows in streams, seeps, springs, and wetlands are sustained at a level that retains or enhances essential ecological functions in the Middle Fork Snoqualmie and Pratt River corridors. Stream channels and associated flood plains occur within their natural flow regimes and the river can move freely across its floodplain. Soil and vegetation functions in upland and riparian settings are retained or enhanced to facilitate precipitation infiltration and groundwater recharge. Large wood complexes form pools and store sediment, resulting in a variety of instream flow conditions.

Water quality

Water quality is sustained at a level that retains the biological, physical, and chemical integrity of the aquatic system and benefits survival, growth, reproduction, and migration of desired aquatic and riparian species. Water quality meets State of Washington water quality standards and supports designated beneficial uses and desired aquatic species. Short-term exceedance of water quality standards (i.e., temporary period of declining water quality) due to management activities occur only when they are expected to result in a long-term improvement in watershed health.

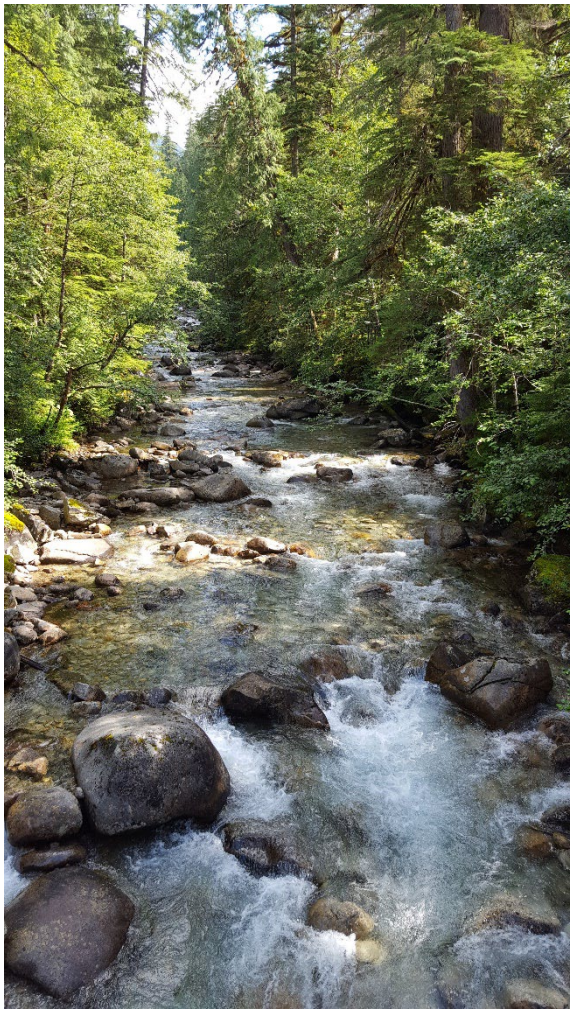


Figure 10 - The Middle Fork Snoqualmie River.

Fish

Wild coastal cutthroat trout populations maintain genetic integrity and diversity. Populations are sustained at a level that can accommodate recreational fishing per Washington Department of Fish and Wildlife fishing regulations. Water temperatures do not exceed water quality standards.

Riparian cover is present over and adjacent to the river for shade and a diverse riparian forest provides a source of large woody material to the river. Instream habitat features would be complex to create spawning and rearing habitats, including large wood and deep pools for thermal refugia. Connectivity with tributaries and off-channel habitat provides access to spawning and rearing habitat, and to refugia during high flows.

Wildlife

Habitat conditions are resilient to future climate change scenarios, support a variety of wildlife species, and contribute to connectivity across the landscape. Adequate habitat security and refugia provide for critical life-history functions such as feeding, winter survival, thermal regulation, and reproduction. Populations of wildlife species are sustained at levels that are consistent with treaty hunting rights and cultural resource use and are also resilient in response to recreational uses within the Middle Fork Snoqualmie and Pratt River corridors. Recreation and other disturbances are managed in a way that reduces negative impacts, minimizes displacement, and allows wildlife to effectively use these habitats. The visiting public is aware of potential impacts to wildlife, and they adjust their behavior to reduce those impacts. Food and other attractants are managed to minimize potential for food-conditioning, subsidization of nest predators, and other human-wildlife conflicts.

Recreation (Middle Fork Snoqualmie River)

A variety of recreation opportunities exist on and adjacent to the Middle Fork Snoqualmie River, which are utilized by a diverse user base from the greater Puget Sound area and beyond. Recreation amenities protect river values, and river corridor management of recreation considers treaty rights and other rights of federally recognized tribes. Recreation facilities and interpretative amenities are welcoming and relevant to a wide range of individuals of varied physical abilities, ethnicities, and cultures. Parking lots are not congested and alternative transportation options may be available for accessing popular recreation amenities. The river corridor will provide a gradient of visitor experiences from developed to primitive backcountry and wilderness settings. The sights and sounds of visitors would be most evident at developed recreation sites along the lower Middle Fork Snoqualmie (downstream of the Taylor River confluence). The density of visitors and recreation-related infrastructure will continue to decrease as one travels farther upstream of the confluence with the Taylor River.

Other Applicable Management Direction

The Forest's trust responsibilities to treaty tribes and the requirement to comply with other Federal laws remains unchanged by direction in this plan. Management direction in the Forest Plan including Forest-wide standards and guidelines for various resources, including wilderness areas, still apply to lands within the wild and scenic river corridors. Where the wild and scenic river corridors overlap with wilderness, the most restrictive policies apply.

Northwest Forest Plan

The Mt. Baker-Snoqualmie Forest Plan was amended by the Northwest Forest Plan in 1994. The decision incorporated seven land allocations into the amended Forest Plans; these land allocations overlap with the existing Forest Plan management areas. The Northwest Forest Plan applies to all National Forest System lands, including the designated WSR segments, administered by the Mt. Baker-Snoqualmie National Forest.

The Northwest Forest Plan allocations within the designated interim river segment corridors varied prior to the 2014 designation; however, the majority of the lands were within the Riparian Reserve allocation. Upon designation, these lands became Congressionally Reserved Areas under the Northwest Forest Plan, included in this category area National Parks and Monuments, Wilderness Areas, Wild and Scenic Rivers, National Wildlife Refuges, Department of Defense lands, and other lands with congressional designations.

Management of these lands follows direction written in the applicable legislation or plans. Management direction from the other land use allocation standards and guidelines found in the Northwest Forest Plan also applies where it is more restrictive or provides greater benefits to late-successional forest related species, unless the application of these standards and guidelines would be contrary to legislative or regulatory language or intent. As such, the Riparian Reserve standards and guidelines apply to the extent that they are consistent with the legislative direction for the Congressionally Reserved Areas. In this case, most of the lands within the WSR corridors would be managed under both the Riparian Reserve and Congressionally Reserved Areas standards and guidelines given the extensive overlap.

Riparian Reserves include areas along rivers, streams, wetlands, ponds, lakes, and unstable or potentially unstable areas where the conservation of aquatic and riparian-dependent terrestrial resources receives primary emphasis. Riparian Reserves are designed to protect the health of the aquatic system and its dependent species. The standards and guidelines for Riparian Reserves are found on the Northwest Forest Plan Record of Decision, pages B-12 to B-17. These standards and guidelines are part of the Aquatic Conservation Strategy found on Northwest Forest Plan Record of Decision, pages B-9 to B-11. The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystem contained within them on public lands. The strategy protects salmon and steelhead habitat on federal lands managed by the Forest Service within the range of Pacific Ocean anadromy.

Another component of the Aquatic Conservation Strategy is watershed analyses, which evaluate the geomorphic and ecologic processes operating in specific watersheds. These analyses should enable watershed planning that achieves Aquatic Conservation Strategy objectives. Watershed analysis provides the basis for monitoring and restoration programs and the foundation from which Riparian Reserves can be delineated. The watershed analyses also provide background and existing condition information on the water resources located within the watershed, including both the Middle Fork Snoqualmie and Pratt Rivers. The Middle Fork Snoqualmie Watershed Analysis was completed in 1998.

Management of Non-Federal Lands

Private Lands

The scenic section of the Middle Fork Snoqualmie overlaps three patented claims representing 69.07 acres. Some of these private lands are used for mineral specimen mining. The 42.580-acre parcel managed by Northwest Wilderness Programs, hosts Goldmyer Hot Springs, a non-profit education facility and hot springs with related facilities. The comprehensive river plan implies no jurisdiction over private land or private rights in river corridors, outside the bed and banks of designated rivers. The plan does not include authority to manage or acquire private land except from willing sellers.

Road Easements

The segment of NFS Road 56 from MP 8.8 at the Forest Boundary to MP 11.9 was established as a King County Road (No. 98990, Lake Dorothy Highway) by Commissioner's resolution dated January 20, 1966. The Forest Service granted a deed on March 14, 1968. The Forest Service, through a 1987 Road Maintenance Cooperative Agreement between King County and the Forest Service, set the maintenance level and was required to maintain this segment. Within the Forest Highway Project Agreement for the paving and reconstruction of the road, dated August 31, 2010, the County and Forest Service agreed to amend the road maintenance agreement to reflect the maintenance responsibilities being transferred to the County. The segment from MP 11.9 to MP 12.4 is to be transferred to the County as a road easement including maintenance responsibilities through the Forest Roads and Trails Act (FRTA) process. This transfer has not been completed as of January 2021. It is expected that road maintenance will meet standards and guidelines for protecting river values as outlined in this plan (p. 22).

An easement issued in 2012 under the Federal Land Policy and Management Act (FLPMA) is held by the Middle Fork Road User's Association for the section of former NFS Road 56 from the gate at Dingford Creek to the old Dutch Miller Gap Trailhead and Campground. The 2005 Middle Fork Snoqualmie Watershed ATM converted NFS Road 56 past the Dingford Creek gate to an NFS trail and private (non-system) road that allows for limited motorized access. The agreement authorizes non-exclusive use of the trail and authorizes maintenance activities by the grantees, subject to provisions from the Forest Service. Any construction or reconstruction of the roadway is subject to approval by the Forest Service. Per the ATM, the Forest is to manage the route to NFS trail standards, any additional work needed to maintain vehicular access is to be done by easement holders, contingent upon a proposal of work to be approved by the Forest Service.

Department of Natural Resources Natural Conservation Area

The Middle Fork Snoqualmie scenic section includes 680.45 acres of the Middle Fork Snoqualmie Natural Resource Conservation Area (NRCA), managed by the Washington Department of Natural Resources (DNR). The State of Washington Natural Resources Conservation Areas Statewide Management Plan of 1992 governs all NRCAs without site-specific management plans and provides policy direction for development of site-specific plans. The Snoqualmie Corridor Recreation Plan of March 2015 established strategies, objectives, and priorities for recreation management on the Middle Fork Snoqualmie NRCA.

Middle Fork Snoqualmie River Park Natural Area

The boundary for the Middle Fork Snoqualmie River contains 96.94 acres of the Middle Fork Snoqualmie Natural Area, an undeveloped park managed by King County and guided by the 1999 Middle Fork Snoqualmie River Park Natural Area Site Management Plan.

Visitor Use Management and Capacity

The goal for visitor use management within the Middle Fork Snoqualmie and Pratt Wild and Scenic River Corridors is to provide opportunities for the public to enjoy and experience the rivers while also protecting and enhancing the river values for which the wild and scenic rivers were designated.

The following assessment describes baseline conditions relative to visitor use, outlines visitor use monitoring and potential management responses, and estimates capacity for visitor use within the Middle Fork Snoqualmie and Pratt Wild and Scenic River Corridors. Section 3(d)(1) of the Wild

and Scenic Rivers Act directs that the agency address user capacities. The 1982 *National Wild and Scenic Rivers System: Final Revised Guidelines for Eligibility, Classification and Management of River Areas* define capacity as: "The quantity of recreation use which an area can sustain without adverse impact on the outstandingly remarkable values and free-flowing character of the river area, the quality of recreation experience, and public health and safety."

Because the degree of potential resource damage associated with visitor use is dependent upon site conditions, timing and seasonality of use, visitor behavior, and other highly variable factors, rather than only the total number of people in a given day or year, visitor capacities are only an estimate. The resiliency and capacity of the river corridor to accommodate visitor use is dependent upon specific site conditions, the timing and seasonality of use, visitor behavior, and other highly variable factors. Accordingly, the visitor use management strategy takes an adaptive approach to respond to changing conditions and provide flexibility in responding to resource concerns.

Visitor Use and River Values

Management of the Middle Fork Snoqualmie and Pratt Wild and Scenic Rivers strives to achieve the desired future conditions for river values (p. 23). Known or potential conflicts between visitor use and desired conditions for river values in the wild and scenic river corridors are summarized below.

Treaty Rights

In addition to river values, management of visitor use must also be consistent with the protection of tribal treaty rights and natural resources, including sensitive and endangered species. Visitor use impacts the ability of tribes to exercise their treaty rights if the location, volume, timing, and/or behavior of visitor's conflict with the ability to hunt, gather, conduct traditional practices and the presence of visitors can influence the distribution of culturally significant species.

Water quality

- **Sanitation:** Fecal pollution caused by untreated human waste at recreation sites can elevate nutrients and pathogens in water sources. Generally, these impacts are localized and short-term but if sanitation issues proliferate throughout a watershed, fecal pollution may cause water quality degradation.

- **Bank erosion:** Erosion caused by user-made "social trails" at heavily-visited water access points can degrade riparian areas and increase sedimentation.

- **Riparian and aquatic invasive plants:** Visitors can transport invasive plant species on clothing, shoes, stock, and gear. Riparian and aquatic invasive plant species are known to degrade water quality and disrupt natural function of riparian ecosystems

Fish

In addition to the above water quality impacts, fish species in these rivers are sensitive to the following visitor impacts:

- **Recreational rock dams:** Rock dams and other in-water structures constructed by visitors and left in the river or streams can become a migration and/or reproductive barrier to fish.

- **Removal of in-water woody debris:** The removal of in-water woody debris for purposes of safety and navigation by boaters could disrupt spawning and rearing habitat. This is not a current issue in the river corridors but could potentially arise as a management concern should the amount of in-water wood in the lower reaches of the Middle Fork Snoqualmie wild and scenic river substantially increase.

Wildlife

Species such as the Harlequin duck are also sensitive to the above water quality impacts, as they may affect prey availability. In addition, wildlife using the areas are also sensitive to the following visitor impacts:

- **Degradation or removal of riparian & upland vegetation:** Social trails at water-access points or emanating from established trails can degrade riparian and upland habitats within the river corridors. Trampling can degrade vegetative cover needed by ground- or shrub-nesting, migratory and non-migratory bird species. Degradation or removal of riparian or upland plants can reduce forage available to beaver, ungulates, bears and other species. Removal of large woody debris in and adjacent to water bodies can also reduce nesting cover, den sites, or loafing sites for wildlife. In many cases, anthropogenic effects on habitat structure (microclimate effects from road or trail edge, social trails, trampling, wood removal) would occur within closer proximity to trails, road and other travel areas[7].

- **Displacement from habitat and disruption of critical life history activities:** Trails, roads, and river-use areas are often in or adjacent to highly productive habitat areas. Existing literature reviews show a variety of recreation impacts on wildlife[8],[9]. The level of recreation intensity (number of visitors, duration of visit, group size) can influence the extent to which wildlife are displaced or disrupted, along with other recreation factors such as speed of approach, predictability, time of day and associated noise[8]. Potential impacts can extend over a variety of distances from trails or roads, depending on species, and type of recreational activities. The impacts of dogs on wildlife is also well

[7] Gaines, W.L., P.H. Singleton, and R.C. Ross. 2003. Assessing the cumulative effects of linear recreation routes on wildlife habitats on the Okanogan and Wenatchee National Forests. Gen. Tech. Rep. PNW-GTR-586. USDA Forest Service, Portland, Oregon. 79 p.
[8] Miller, A.B., D. King, M. Rowland, J. Chapman, M. Tomosy, C. Liang, E.S. Abelson, and R.Truex. 2020. Sustaining wildlife with recreation on public lands: a synthesis of research findings, management practices, and research needs. Gen. Tech. Rep. PNW-GTR-993. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 226 p.
[9] Nelson, L.H., and D. Bailey. 2021. The "Recreation Boom" on Public Lands in Western Washington: Impacts to Wildlife and Implications for Treaty Tribes. Natural Resource Department, Treaty Rights Office, The Tulalip Tribes, Tulalip, WA. 40 pp.

documented[10]. Chronically disturbed nesting areas can be abandoned[8,11,12]. Recreational disturbance during calving season can reduce reproductive success in elk[8].

For a given type of recreational activity, the probability of a deer becoming alert and flushing, or a bird being flushed from a nest or avoiding habitat increases as the distance of the animal to the activity decreases. The distance over which disturbance or flushing occurs may be greater when dogs are present. Impacts at greater distances tend to be less-readily observable, but are documented, nonetheless. For example, there can be a higher probability of elk avoiding an area, being displaced from an area, or fleeing from recreationists within several hundred meters or more, and the distance may be greater depending on whether they are hiking, horseback riding, or mountain biking[13],[14]. Bears may avoid quality foraging habitat within several hundred meters or more of roads and hiking trails, sometimes further, depending on level of use, season, and other factors[15],[16].

Recreationists and their accompanying dogs can also disrupt the use of foraging, denning, calving, fawning or kidding areas by species such as bears, elk, deer and mountain goats. The presence of dogs accompanying recreationists can elicit strong responses from wildlife[17],[18], especially when off-leash, and even the scent of dog urine or feces can lead to wildlife avoidance of those areas*[19].

The noise associated with recreational activities, even from human conversations, can cause displacement from habitat, alter breeding behavior, and mask important animal communication[8]. A relatively high disturbance factor can be associated with activities that involve "loud conversations, high frequency of use, unpredictable patterns of movement, quickly moving traffic, or a combination of these factors"[20]. For example,

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[10] Hennings, Lori. 206. Impacts of dogs on wildlife and water quality. Technical Report, Metro Parks and Nature. Portland, OR.
[11] Rockwell, S.M. 2018. Conservation Assessment for Harlequin Duck (Histrionicus histrionicus). USDA Forest Service, Region 6 and USDI Bureau of Land Management, Oregon and Washington Interagency Special Status and Sensitive Species Program.
[12] Robertson, G. J. and R. I. Goudie. 2020. Harlequin Duck (Histrionicus histrionicus), version 1.0. In Birds of the World (S. M. Billerman, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.harduc.01
[13] Wisdom, M.J., A.A. Ager, H.K. Preisler, N.J. Cimon, and B.K. Johnson. 2004. Effects of off-road recreation on mule deer and elk. In: Transactions of the 69th North American Wildlife and Natural Resources Conference: 531-550
[14] Wisdom, M.J. H.K. Preisler, L.M. Naylor, R.G. Anthony, B.K Johnson, and M.M. Rowland. 2018. Elk responses to trail-based recreation on public forests. Forest Ecology and Management 411: 223-233.
[15] Kasworm, W.F., and T.L. Manley. 1990. Road and trail influences on grizzly bears and black bears in Northwest Montana. International Conference on Bear Research and Management 8:79-84.
[16] Fry, E. 2018. Nature-based non-consumptive recreation and the American black bear: A review. North Carolina State University, Raleigh, NC. 13 pp.
[17] Miller, S.G., R.L. Knight, and C.K. Miller. 2001. Wildlife responses to pedestrians and dogs. Wildlife Society Bulletin 29:124-132.
[18] Lenth, BE., R.L. Knight, and M.E. Brennan. 2008. The effects of dogs on wildlife communities. Natural Areas Journal 28:218-227.
[19] Hennings, Lori. 206. Impacts of dogs on wildlife and water quality. Technical Report, Metro Parks and Nature. Portland, OR.
[20] Miller, A.B., D. King, M. Rowland, J. Chapman, M. Tomosy, C. Liang, E.S. Abelson, and R.Truex. 2020. Sustaining wildlife with recreation on public lands: a synthesis of research findings, management

cross-country travel can potentially be more disruptive to wildlife than other non-motorized recreation because of the unpredictability.

- **Anthropogenic food sources, food-conditioning, and associated human-wildlife interactions:** The availability of anthropogenic food sources relates in large part to recreation site conditions and has a negative impact on wildlife species. Bear-human interactions and conflicts are well-documented in the area and can result in lethal removal of bears due to human safety concerns. Mountain goats can become conditioned to anthropogenic mineral (salt) sources. Food-subsidies to crows and other nest predators can have a negative impact on special status species such as the marbled murrelet, Harlequin ducks, along with a variety of other migratory and non-migratory bird species.

- **Defensive or predatory wildlife attacks:** Although attacks on people by wildlife are generally rare, certain human behaviors or activities such as travelling at dawn or dusk, moving quickly or erratically (i.e., mountain biking or running), or the presence of unleashed dogs can increase that potential[21],[22]. Wildlife attacks can result in injury to visitors or their accompanying animals, temporary closure of trails or campsites, negative public opinions toward wildlife, and ultimately can lead to the lethal removal of animals. Such attacks may indicate undesirable human behaviors around wildlife, conditioning of wildlife to anthropogenic food sources and/or conflict with existing visitor use patterns within wildlife habitat. The presence and behavior of dogs can also influence the probability of attacks on humans or their dogs by wildlife, although the directionality of that influence can vary depending on the species, context, and whether the dog is on leash.

Recreation

- **Recreation site conditions:** Degradation of recreation site conditions including the proliferation of litter, sanitation issues, damage to vegetation and erosion. Site conditions impact the visitor experience in addition to resource values.

- **Density of visitors:** The density of visitors along the river corridor affects the visitor experience. The desired conditions for recreation along the Middle Fork Snoqualmie corridor strive to maintain a gradient of visitor experiences from developed front-country to primitive backcountry and wilderness settings. The sights and sounds of visitors would be most evident at developed recreation sites along the lower Middle Fork Snoqualmie downstream of the Taylor River confluence and the density of visitors and recreation-related infrastructure should continue to decrease as one travels upstream.

practices, and research needs. Gen. Tech. Rep. PNW-GTR-993. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 226 p.

[21] Mattson, D. K. Logan, and L. Sweanor. 2011. Factors governing risk of cougar attacks on humans. Human-Wildlife Interactions 5:135-158.

[22] Penteriani, V., M. del Mar Delgado, F. Pinchera, J. Naves, A. Fernandez-Gil, I. Kojola, S. Harkonen, H Norberg, J. Frank, J. M. Fedriani, V. Sahlen, O-G Stoen, J.E. Swenson, P. Wabakken, M. Pellegrini, S. Herrero, and J.V. Lopez-Bao. 2016. Human behavior can trigger large carnivore attacks in developed countries. Sci. Rep. 6, 20552; doi: 10.1038/srep20552.

- **Congestion at parking areas:** Full and overflowing parking lots at recreation sites may decrease visitor satisfaction and/or prohibit access to the river corridor. Parking outside of designated areas within the river corridor may damage natural resources.

Visitor Use Data

The assessment considered a range of data regarding visitor use and resource conditions relative to visitor use within the planning area. The following data informed assessment of current conditions and estimated visitation numbers:

- **Campsite monitoring data.** Campsite monitoring evaluates site conditions including ground disturbance, the presence of human waste and litter, and damage to vegetation. Field staff inventoried and evaluated impacts to 46 recreation sites and campsites on or near trails within Alpine Lakes Wilderness in 2012 utilizing the national protocol for wilderness recreation site monitoring. Additional surveys were conducted in 2017 to inventory conditions in 102 roadside and backcountry dispersed campsites throughout the remainder of the planning area.

- **Visitor use monitoring.** Car counters were utilized at several locations from 2017-2019 to estimate the number of visitors in the river corridor. Counts of vehicles at trailhead parking lots from 2017-2019 were also reviewed. In addition, the assessment considered findings from the 2015 Mt. Baker-Snoqualmie National Forest National Visitor Use Monitoring (NVUM) effort. Visitation data estimating on-water use is not currently available but has been identified as a need going forward.

- **Visitor use surveys.** In the fall of 2018, the USFS partnered with the University of Washington (UW) Outdoor Recreation and Data Lab and Mountains to Sound Greenway Trust to describe outdoor recreational use by visitors to the Middle Fork Snoqualmie Valley. An intercept survey collected information from 192 respondents regarding their activities, motivations, likes and dislikes, and experiences within the river corridors.

- **Trail use modeling.** A research partnership among staff from the UW Outdoor Recreation and Data Lab, Mt. Baker-Snoqualmie National Forest, the U.S. Forest Service Pacific Northwest Research Station, and Washington Trails Association is utilizing an array of data sources to estimate trail use on the Forest. The modeled estimates of visitation for trails within the river corridor were created using a statistical random-effects model which relates on-site visitation to social media data, calendar (time of year, holidays), weather (precipitation), and estimate use-level variables.[23]

- **Information on human-wildlife conflicts and impacts**. Anecdotal reports and observations from concessionaires, employees, reports from the public, and trail reports from various recreation-related social media sources document the occurrence of human-wildlife encounters and conflicts. The campsite monitoring data described above can also

[23] A more complete description of the data that has been collected and the ongoing research is described in:
Wood, SA, SG Winder, EH Lia, E White, C Crowley, A Milnor. Next-generation Visitation Models using Social Media to Estimate Recreation on Public Lands. Scientific Reports 10: 15419. *https://www.nature.com/articles/s41598-020-70829-x*
Fisher, DM, SA Wood, DJ Blanha, EM White, S Lange, A Weinberg, M Tomco, E Lia. 2018. Recreational use in dispersed public lands measured using social media data and on-site counts. Journal of Environmental Management 222:465–474.

provide indications of impacts on wildlife (litter, etc.). Communications with WDFW personnel document their response to human-wildlife conflicts and bear relocation or removal.

- **Field ranger observations**. Wilderness patrol logs from 2017-2021 include data related to trail and overnight use, visitor behavior, the presence of campfire rings and unattended campfires, off-leash dogs, and litter.

- **Satellite imagery.** Imagery of the upper reaches of the river corridors indicates the presence of social trails in sub-alpine areas where canopy cover is limited.

- **Road and trail buffers.** The visitor use analysis considers how the proximity of roads and trails may influence potential for wildlife impacts. A Geographic Information System (GIS) mapping effort buffered all system roads and trails within the analysis area, as well as the portion of river channel used most by boaters, with the 100-meter and 500-meter distances to determine the proportion of area affected and overlap with habitat types. Stress-responses, whether visible or not, may be more likely when the encounter is closer in proximity. A 100-meter buffer is inclusive of more immediate-range impacts on wildlife and their habitat, recognizing that this may be more encompassing for some species than others. However, displacement, habitat avoidance or disruption of activities can also occur out to several hundred meters or more from these features, especially for bears, elk, mountain goats, and raptor species. More far-ranging impacts on wildlife are represented within the 500-meter buffer.

- **Habitat modeling.** Modeled wildlife habitat shows important areas for spring and fall forage for bears and summer forage for elk relative to recreational features including roads and trails.

Visitor Use Analysis

Assumptions

Visitor use is dynamic. The amount, frequency, and types of recreational visits in the Middle Fork Snoqualmie and Pratt River corridors are subject to several variables. The following factors are known or assumed to influence how visitor use occurs, and will continue to occur, throughout the river corridors.

- **Road conditions.** The primary access route for the Middle Fork Snoqualmie River as well as the lower reaches of the Pratt River, NFS Road 56, is subject to damage caused by landslides, rockfall, erosion, and flooding. Temporary road closures are not infrequent. The gravel portion of NFS Road 56 between Taylor River and Dingford Creek is maintained for high-clearance vehicles and is not suitable for passenger vehicle traffic. Road conditions and irregular road maintenance limit visitation upstream of the Taylor River confluence with the Middle Fork Snoqualmie. An increase of road maintenance frequency or improvements to road conditions would likely result in additional traffic in the upper Middle Fork Snoqualmie river corridor. However, it is not expected that the maintenance of this section will increase, per the 2005 Access and Travel Management Decision for the Middle Fork Snoqualmie.

- **Trail conditions and maintenance levels.** Trail closures and reroutes are not uncommon in the valley, particularly along the Middle Fork Snoqualmie Trail #1003, as clay soils in

the valley are subject to landslide. Several upland trails receive little to no maintenance and, therefore, see little visitor use. The improvement of existing trails or the development of new upland trails outside of the river corridor could drive increased use of parking lots and ancillary facilities within the river corridor.

- **Parking capacity.** Wetlands and clay soils are a limiting factor for expanding parking lots, trails, or other recreation facilities, as there is a limited amount of suitable land to expand facilities. The Forest does not anticipate significantly expanding parking lots within the river corridor to increase physical capacity for parking in the valley. Enforcement of a prohibition to parking outside of designated parking areas could reduce visitation to popular sites if visitation exceeds capacity of existing facilities.

- **Alternative transportation.** During the summers of 2018 and 2019, King County Metro operated a seasonal shuttle service to the Department of Natural Resource's Mailbox Peak Trailhead on the Middle Fork Snoqualmie Road (approx. 9 mi from the Middle Fork Snoqualmie River Trailhead). If the County were to expand service up the valley to the Middle Fork Trailhead, visitation within the river corridor could increase.

- **Social media.** The popularity of recreation sites is largely influenced by social media trends. Destinations with unique features or high levels of visual interest may gain popularity and lead to unexpected surges in visitation. Wildlife sightings that are reported could also fuel subsequent increases in visitation by visitors seeking to observe animals.

- **Closure of nearby recreation sites.** Displacement of visitors from other day or overnight destinations within the I-90 corridor may increase visitation to sites within the Middle Fork Snoqualmie or Pratt River corridors.

- **Campground operations.** The Middle Fork Snoqualmie Campground is a significant destination for visitors in the valley during its normal operating season (late May – mid September). While outside of the river corridor itself, many of the campground visitors visit the river during their stay. Therefore, the information they receive at the campground regarding human-wildlife conflict-avoidance and how to reduce impacts could influence their behavior in the river corridor. Expansion or improvement of the campground facilities or a longer season of operations could increase the number of visitors seeking day-use opportunities in the river corridor.

- **Climate change**. The amount, type, and timing of precipitation in the upper watershed influences how and when visitors recreate on the Middle Fork Snoqualmie River. On-water visitor use by whitewater boaters is correlated with spring snowmelt. Visitation in the upper reaches of the river corridors by trail users depends upon snow levels. As climate change influences the snowpack volume and/or the timing of snowmelt, visitation patterns may respond accordingly. A longer snow-free season might result in an increased in use in alpine regions of the river corridors. An increase in extreme heat events and overall warmer summer temperatures may increase demand for recreation on and along the rivers, increasing use in riparian areas.

- **Trail congestion.** Some trail users adjust the timing of their visits to early morning or late evening hours to avoid crowding, thus encroaching into sensitive times for wildlife.

- **Emergent activities and/or equipment.** Advances in outdoor equipment and/or the emergence of new recreation activities can drastically alter visitor use patterns, enabling access to formerly difficult-to-reach places or expanding the season of use.

Additional assumptions relevant to specific sections of the rivers are listed as "factors for future visitation" in the following analysis.

Visitor Use Analysis Areas

The interdisciplinary team identified five distinct areas of analysis for developing visitor use management strategies and capacity estimates within the planning area (Table 3, Figure 11). These areas were identified based on desired conditions for a variety of settings throughout the river corridor, including varied levels of development and accessibility to the river from roads and trails. The Pratt River corridor from Melakwa Lake to the confluence with the Middle Fork Snoqualmie will be considered one area of analysis, while the Middle Fork Snoqualmie River is divided into four distinct sections according to river mile (RM).

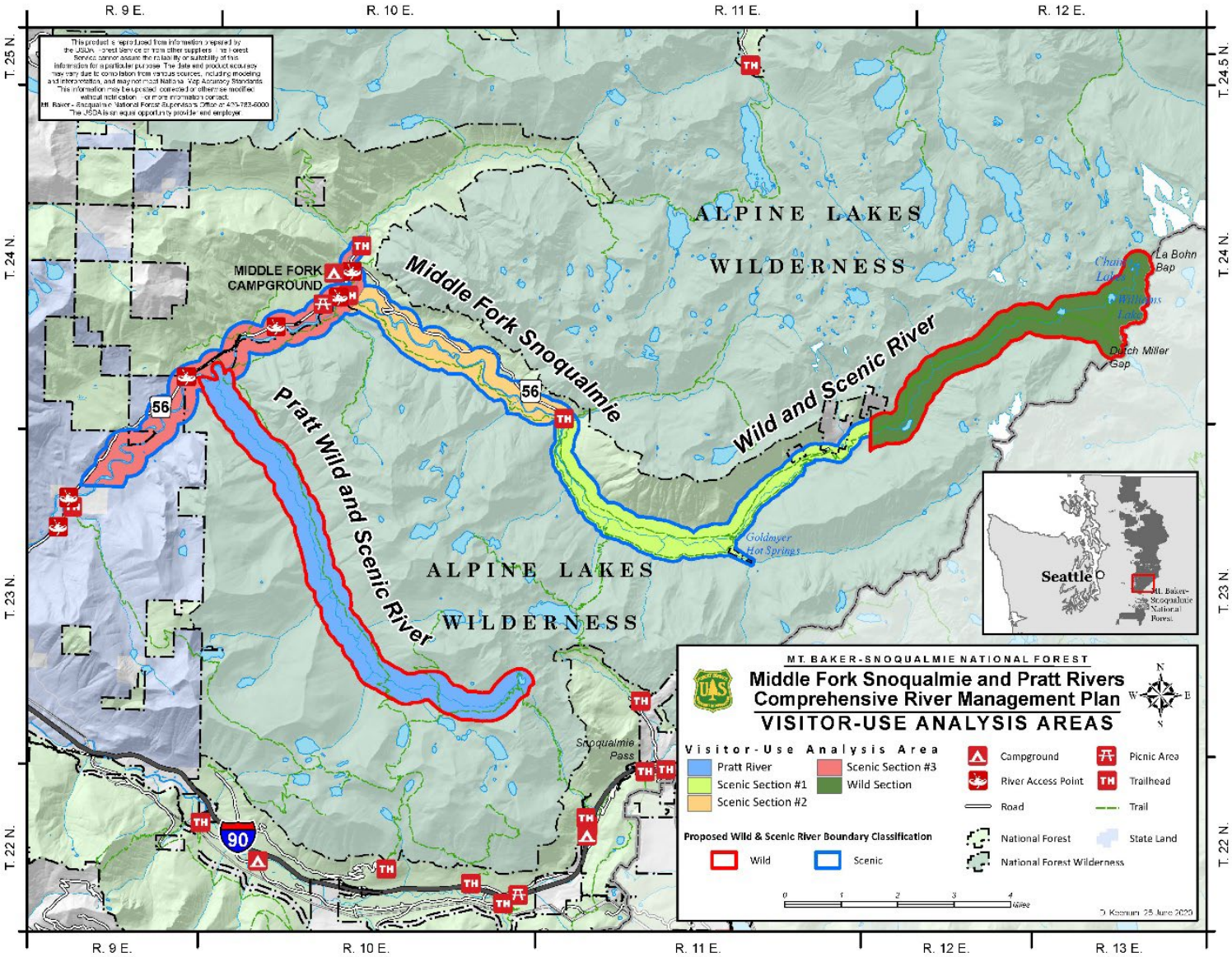


Figure 11 – Visitor Use Analysis Areas

Table 3 - Visitor Use Analysis Areas

River	Visitor Use Area	Area Acres	*Total River Miles
Middle Fork Snoqualmie	Wild Section: Headwaters to the wilderness boundary (RM 78)	2,509	**8.5
	Scenic Section #1: Wilderness boundary to Dingford Creek (RM 78-70)	2,115	8.1
	Scenic Section #2: Dingford Creek to Taylor River (RM 70-65)	1,549	5.5
	Scenic Section #3: Taylor River to the terminus near Granite Creek (RM 65-57)	2,354	***9.0
Pratt River	Pratt River	3,133	10.1

*River miles are estimated by GIS and may vary over time.
**The Wild section includes 7.8 river miles of the Middle Fork Snoqualmie and 1.6 river miles of an unnamed stream from Dutch Miller Gap downstream to confluence of mainstem Middle Fork Snoqualmie.
***Scenic Section #3 includes 1.2 river miles of the Taylor River in addition to 7.8 river miles of the Middle Fork Snoqualmie.

Pratt River Corridor

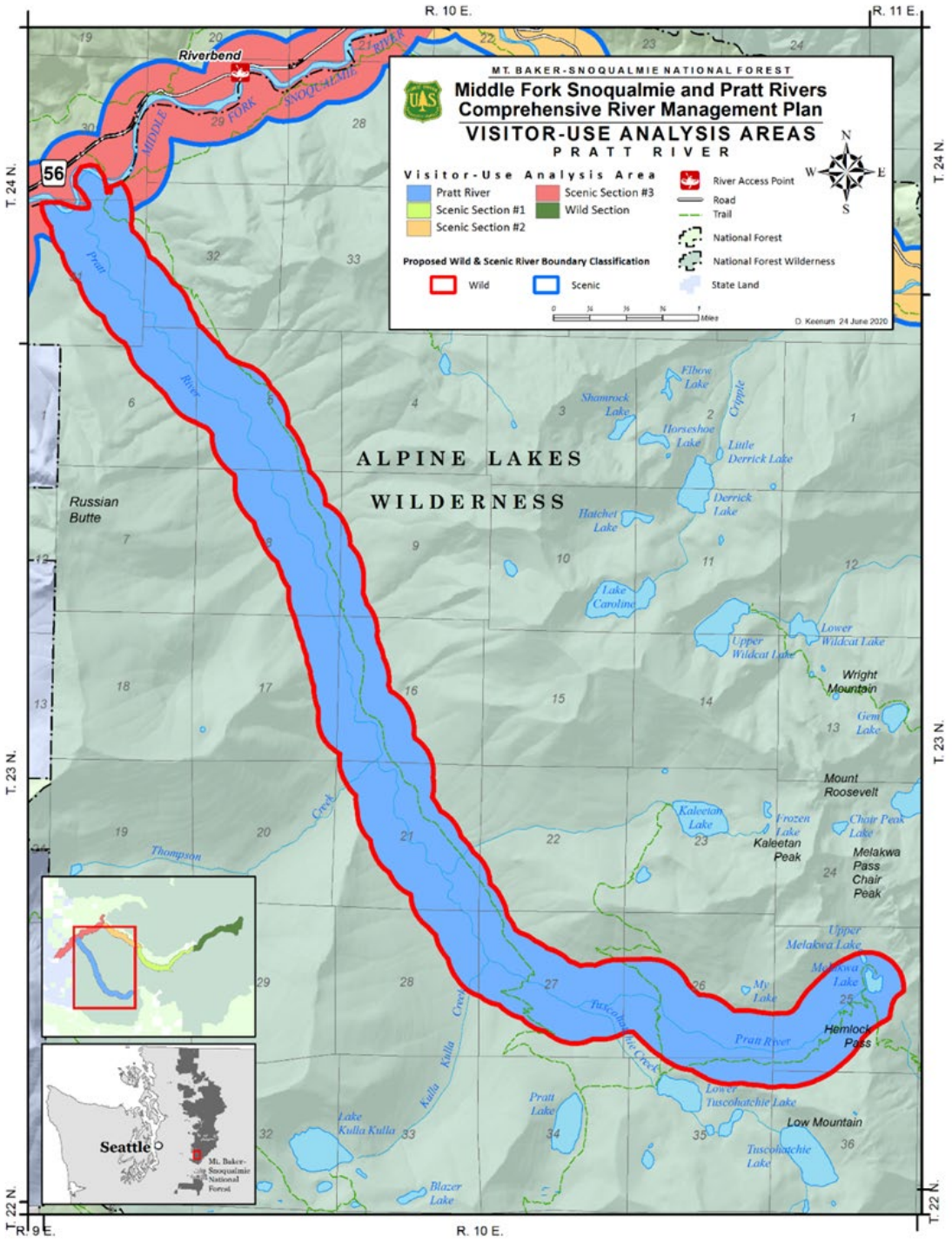


Figure 12 - Pratt River Corridor

Visitor Use Setting

The Pratt River is wholly within the Alpine Lakes Wilderness. The Pratt River corridor is generally difficult to access. On-river use is thought to be limited by the extremely long portages

required, the technical nature of the river, and a large degree of in-water hazards. Visitation is low throughout most of the river corridor but increases substantially at the headwaters near Melakwa Lake, which can be accessed from I-90 on the popular Denny Creek Trail #1014.

The Pratt River Trail #1035 travels throughout much of the river corridor, largely above the river itself. Access to the lower reaches of the river, near the confluence with the Middle Fork Snoqualmie requires a 3.5-mile hike from the nearest trailhead. The Pratt River Trail #1035 is a long, forested trail along the valley that does not offer many views or vistas compared to other nearby trails. Visitation on the section of trail within the Pratt River corridor is very light. Attractions along the trail include several pockets of lowland old growth forest as well as some of the enduring relics of past railroad logging in the valley. The trail may be of special interest to equestrians given that there are not many other trails in the area that both provide adequate trailer parking and offer a longer riding experience, however the trail is not frequently maintained and due to the trail design is accessible only for advanced riders.

Figure 13 - Melakwa Lake at the headwaters of Pratt River.

The headwaters of the Pratt River corridor including the Melakwa Lakes is generally accessible to hikers from late June to late September as a day hike or overnight from the highly trafficked I-90 corridor. Campsites at Melakwa Lakes are utilized by backpackers as well as rock climbers approaching Kaleetan or Chair Peaks. The availability of parking at the Denny Creek Trailhead and the scenic nature of the Melakwa Lakes area influence visitation levels. The Upper and Lower Melakwa Lakes are stocked with rainbow trout for a recreational fishery, where they are considered by WDFW to be functionally sterile.

Current conditions

Throughout the main river corridor, the Pratt River Trail is largely above the river and access to the streambank is limited. There is little evidence of visitor impacts near the river or along the trail itself. There are no known infestations of riparian or aquatic invasive plant species within the river corridor. Recreation site condition surveys in 2017 identified a small cluster of campsites near confluence of the Pratt and Middle Fork Snoqualmie Rivers and only three campsites along the entire river corridor, below the headwaters at Melakwa Lakes. Overall campsite conditions were in good condition with minimal litter, human waste, or damage to vegetation reported.

Camping in the Melakwa Lakes basin is limited to use of existing sites only per Forest wilderness regulations. Wilderness recreation site inventories in 2012 identified 14 sites within the Melakwa Lake basin, 10 of which were located less than 200 feet from the lake shore. No human waste was detected at any of the sites. Four of the sites contained litter and more than half of sites had evidence of some tree damage associated with camping (generally scars, broken branches, nails or other forms of manipulation). Ongoing monitoring of camping in Melakwa Lakes suggests that most campsites are occupied on weekends during the main season of use (June-August). Rangers maintain and monitor two wilderness privies in the basin. Privies sometimes fill up and are

moved during the season. Privies have not been moved more than once per season. A network of social trails exists in the camping area between Upper Melakwa and Melakwa Lakes.

Wildlife habitat structure in this corridor is influenced by the substantial amount of historic timber harvest that occurred in the 1930's. Established trails pass through riparian habitat, modeled spring bear habitat as well as ungulate winter range at lower elevations of the Pratt River. Due to the relative low visitor use of the river valley, this area may provide benefits for bear and other species during the busier summer months. Melakwa Lake is adjacent to mountain goat habitat. Approximately 27 percent of the Pratt river corridor is within 100 meters of a trail, and 88 percent is within 500 meters.

Reports by hikers of mountain goats, deer and bears using this area suggest the need for vigilance in human behavior in order to avoid human-wildlife conflicts, as well as to avoid displacement from preferred foraging areas. Field ranger reports have noted a high number of dogs off-leash, which is also corroborated by trail reports from the public. The average incidence of dogs observed off-leash was highest when compared to the other visitor use areas, especially around Melakwa Lake.

Factors for future visitation

On-river use is not expected to significantly increase, as access to the river itself is mostly limited to cross-country travel. For many years, the Pratt River Trail was lightly maintained and hard to follow from the junction of Pratt River Connector Trail. Stock users have difficulty accessing the highly technical and slippery trail. Maintenance of the trail to meet standards for stock use could increase use of the trail by equestrians seeking longer distance rides.

Management of parking at the Denny Creek and Franklin Falls Trailheads may influence visitation levels at Melakwa Lakes. Expansion of the parking lot is planned and could allow for greater visitation. However, the countering effect of enforcement of no-parking zones outside of the trailhead could ultimately reduce and limit the number of visitors to the lakes below current levels.

Visitor use indicators

The primary indicators for monitoring visitor use impacts to river values in the Pratt River Corridor include the following:

- The presence of unburied human waste and/or full privy where backcountry privies exist.
- Reports of unsecured food and garbage.
- The presence of off-leash dogs.
- Reports of human-wildlife conflicts
- Reports of wildlife being disrupted by visitors.
- Evidence of social trails.
- Wilderness campsite condition scores at campsites within 200' of streambanks or shorelines.
- Riparian or aquatic invasive plant occurrences.

See the visitor use monitoring and management strategy (p. 58) for details about thresholds, monitoring protocols, and potential management responses.

Estimated capacity

Visitation to the Pratt River Corridor is estimated at 9,428 people annually with 85% of visits occurring near Melakwa Lakes.[24] Over 70% of visitation occurs May-September. Most visits are day-use only and overnight use is primarily concentrated at Melakwa Lakes. While most of the 14 campsites at Melakwa Lakes are occupied on weekends, overnight use is generally low with small party sizes.

The estimated capacity for the Pratt River corridor is 10,000 visitors annually. This estimate reflects a desire to maintain relative visitation rates over time, assuming positive trends in visitor use indicators, and considers the following:

- Use is very light along entirety of river corridor except for seasonal trail use and overnight use at Melakwa Lakes. Current visitor use within the river corridor does not appear to negatively impact river values of recreation and fish. Low visitation rates within the river corridor are assumed to benefit wildlife.
- If overnight use at the lakes were to increase, it is expected that privies would fill up and the thresholds for human waste could be exceeded.
- Given the low use levels along much of the river corridor, this area may be more sensitive to an increase in visitation.
- The density of social trails at the lakes is undesirable.
- There is a higher prevalence of reports of off leash dogs on the Melakwa Lakes Trail compared to other visitor use analysis areas.
- It is believed that visitation in the Melakwa Lakes area exceeds standards for visitor encounters and exceeds the estimated wilderness capacity per wilderness management direction in the 1990 Forest Plan.[25] Additional monitoring is needed to evaluate conditions relative to standards for wilderness character.[26]

[24] This value represents the average of five years of modelled visitation data from 2014-2018 for trail use on both the Pratt River Trail and Melakwa Lakes Trail. The model likely overestimates actual use in the river corridor because the most accessible and popular areas of these trails are outside the river corridor itself (for example the first 3.5 miles of the Pratt River Trail along the Middle Fork Snoqualmie River and the lower reaches of Melakwa Lakes Trail near Lower Tuscohatchie Lake).

[25] The capacity for the wilderness lands that comprise the Pratt River corridor is estimated at 4,609 visitors annually. This estimate uses the capacity coefficients for “Trailed Wilderness” (3.75) and “General Wilderness” (0.25) established in the 1990 Forest Plan. GIS analysis found 2,040.1 acres of general wilderness and 1,093 acres of trailed wilderness within the Pratt River corridor. Acres were multiplied by the relevant coefficients to estimate capacity.

[26] Applicable standards and guidelines for wilderness management areas are found in the 1990 Forest Plan, pages 4-209 – 4-214

Middle Fork Snoqualmie River Wild Section

Headwaters to Wilderness Boundary (RM 78)

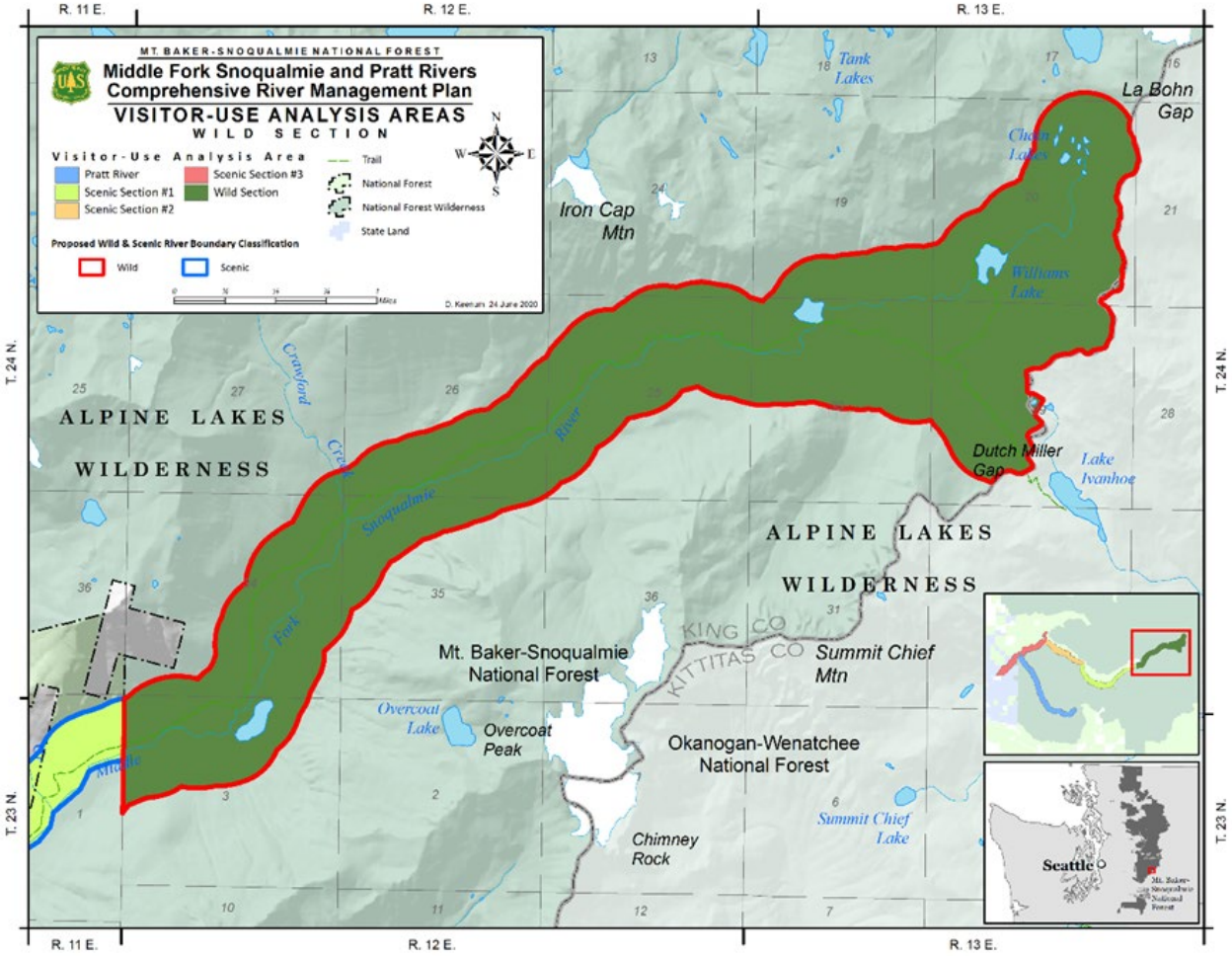


Figure 14 - Middle Fork Snoqualmie Wild Section

Visitor Use Setting

This river segment is wholly within the Alpine Lakes Wilderness. Due to the long approach for access and limited season of use, visitation is low within this section. The sights and sounds of other visitors are minimal. Located above 3,000' elevation, visitor use is primarily limited to late June-September by hikers and equestrians on multiple-day trips and occasional long-distance trail runners. Access to this section of river requires a minimum of 8.5 miles by trail from the nearest parking lot at Dingford Creek Trailhead. Chain Lakes, a series of granitic tarns at the upper northeastern corner of the headwaters, are a destination for cross-country travel, primarily for hikers coming up from the East Fork Foss Trail on the Skykomish Ranger District. This section is

occasionally used as a Pacific Crest Trail alternate route via Dutch Miller Gap.

Figure 15 - Williams Lake. Photo by Alex Weinberg.

Current conditions

Resource concerns for this segment are limited due to the relatively low numbers of visitors. There are no known infestations of riparian or aquatic invasive plant species. Encounters between visiting parties are generally low and there are outstanding opportunities for solitude in this section. The 2012 wilderness campsite inventory detected 32 campsites in this section. Campsites were minimally impacted, and no human waste was detected. Surveys of the same areas in 2017 detected only 22 sites, one of which contained evidence of unburied human waste. Backcountry privies were installed at two of the main camping areas, Pedro Camp and Williams Lake, during the 2020 field season.

The higher elevation of this segment suggests a lower potential to function as winter range for ungulates. However, the habitat model showed comparatively higher summer elk forage values in this segment. The habitat in this area has not been directly influenced or altered by road construction or timber harvest. However, habitat in this area is functionally influenced by the presence of trails (22% of area is within 100 m of a trail, 86% is within 500 m), as with the other visitor use analysis areas. Natural openings, such as open shrub-fields and avalanche chutes provide shrubs and herbaceous plants that are browsed by bears and ungulates, provide nectar resources for pollinators, and may include berry-producing shrubs that provide food for a variety of birds and mammals. Wetlands, deciduous riparian areas and Williams Lake are expected to be important foraging areas for bats. Open, non-forested areas such as talus fields, rock and transient river bars provide important basking areas for reptiles, as well as cover and burrows for small mammals. Berry patches have been noted along the trail and around the lake. Bears are occasionally encountered, which could lead to human-bear encounters or displacement from

foraging areas. Wilderness staff noted a comparatively lower number of dogs observed off-leash in this visitor use area.

Factors for future visitation

Because this section is relatively remote and difficult to access, visitation is not expected to increase substantially. The potential improvement of fords and bridges on the Middle Fork Snoqualmie Trail downstream of this section could result in increased visitation by stock users, whose access is currently limited by inadequate crossings. Road and trail conditions affecting the accessibility of the East Fork Foss Trail on the Skykomish Ranger District could influence the number of visitors at the Chain Lakes in the upper reaches of this section.

Visitor use indicators

The primary indicators for monitoring visitor use impacts to river values in the Wild Section of the Middle Fork Snoqualmie River Corridor include the following:

- The presence of unburied human waste and/or full privy where backcountry privies exist.
- Reports of unsecured food and garbage.
- The presence of off-leash dogs.
- Reports of human-wildlife conflicts
- Reports of wildlife being disrupted by visitors.
- Evidence of social trails.
- Wilderness campsite condition scores at campsites within 200’ of streambanks or shorelines.
- Riparian or aquatic invasive plant occurrences.

See the visitor use monitoring and management strategy (p. 58) for details about thresholds, monitoring protocols, and potential management responses.

Estimated capacity

Annual visitation to the wild section of the Middle Fork Snoqualmie River is estimated at 1,128 visitors.[27] Most visitation occurs late June-September, when trails are free from snow. The estimated capacity for the Wild Section of the Middle Fork Snoqualmie River is 1,200 visitors annually. This estimate reflects a desire to maintain current visitation levels over time, assuming positive trends in visitor use indicators, and considers the following:

- Current visitation is light and there is no evidence that visitor use threatens the river values of recreation, fish, or wildlife.
- Backcountry privies installed in 2020 will facilitate proper waste disposal at commonly used camping areas.
- It is believed that this section is well-within standards for visitor encounters and is under the estimated wilderness capacity per wilderness management direction in the 1990 Forest Plan.[28]

[27] This value represents the average of five years of modelled visitation data from 2014-2018 for trail use on the Williams Lake Trail at the headwaters of the Middle Fork Snoqualmie River.

[28] The capacity for this area is estimated at 3,535 visitors annually per wilderness management direction in the 1990 Forest Plan. This estimate uses the capacity coefficients for “Trailed Wilderness” (3.75) and “General Wilderness” (0.25) established in the 1990 Forest Plan. GIS analysis found 1,681.4 acres of

- Although the section could likely absorb more visitation without negative impacts to water quality, the desired conditions for the recreation river value call for a low density of visitors in the upper reaches of the watershed. This section also has the greatest amount of summer forage for elk relative to other reaches of the river system, but the high proportion of area within 500 meters of trails could be affecting the degree to which elk use this forage resource. Maintaining a low density of visitors is also valuable from the standpoint of habitat integrity and minimizing disturbance to wildlife.

Middle Fork Snoqualmie Scenic Section #1

Wilderness boundary to Dingford Creek (RM 78-70)

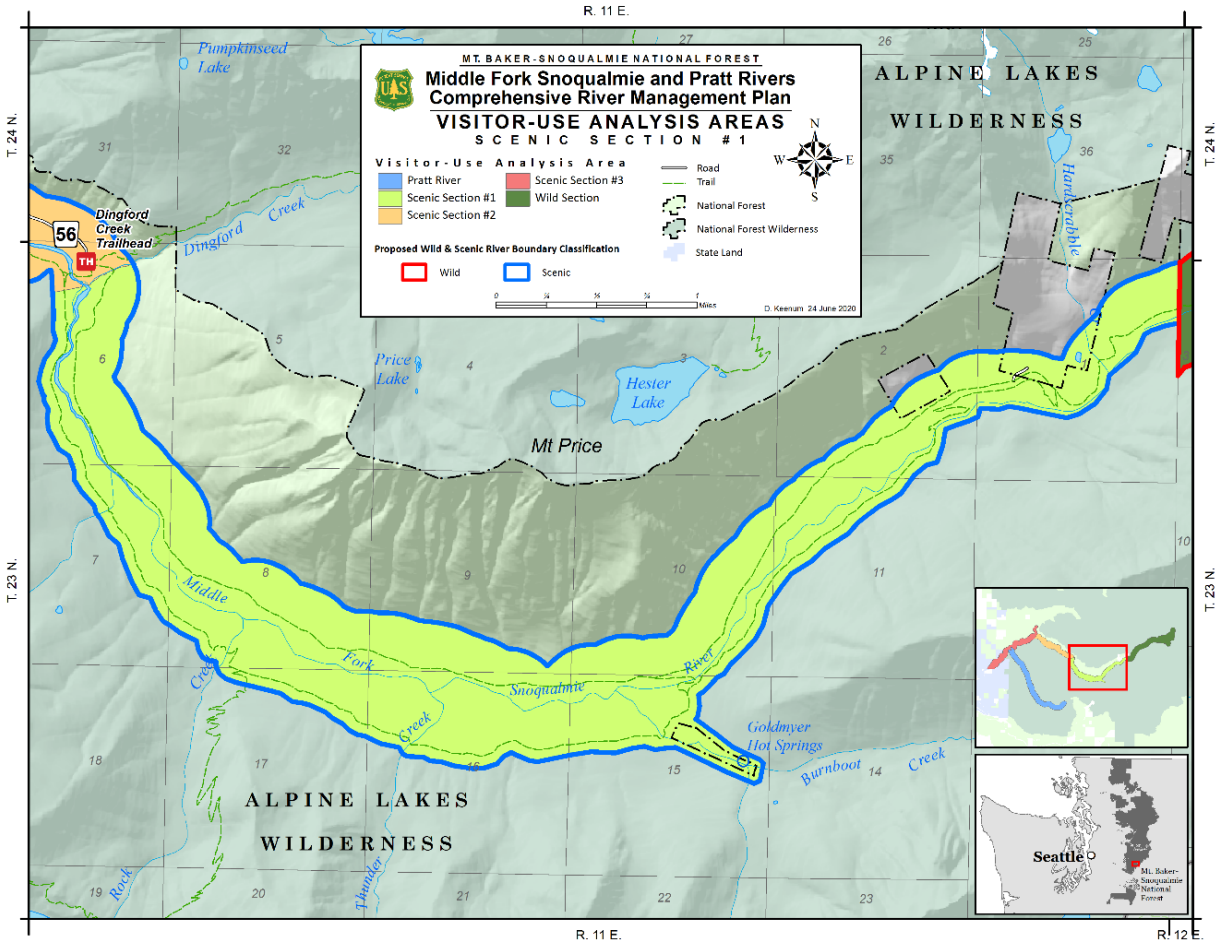


Figure 16 - Middle Fork Snoqualmie Scenic Section #1

Visitor Use Setting

A significant portion of visitors who access this section of river are hiking or biking to the privately-owned and managed Goldmyer Hot Springs property on Burnboot Creek. Goldmyer limits day and overnight visitors to 20 persons per day. Visitation tapers off upstream of the hot springs. Aside from the hot springs, most travel is out-and-back (such as the long loop for

general wilderness and 827.9 acres of trailed wilderness within the Middle Fork Snoqualmie wild segment. Acres were multiplied by the relevant coefficients to estimate capacity.

mountain biking or trail running), or through-travel to access backcountry destinations in the wilderness upstream.

Figure 17 - Caretaker's cabin at Goldmyer Hot Springs.

On-river use is generally limited to fishing, dispersed swimming and picnicking, and the occasional whitewater boating activity. The river contains an expert-level Class V whitewater run from Hardscrabble Creek to Burnboot Creek. The Middle Fork Trail #1003 runs along the south side of the river corridor and the Dutch Miller Gap Trail #1030 runs along the north side of the river corridor. These trails are open to hikers, equestrians, and bicycles. The Middle Fork Trail is open to bicycles odd-numbered calendar days June 1 - October 31, dependent upon trail conditions. The trail is open to stock July 1 – October 31, depending upon trail conditions. An annual trail running event brings up to 200 people at one time to the Middle Fork Trail. The trails are heavily forested, offer sights and sounds of the river, and provide unique loop opportunities for long-distance running and mountain biking.

While no longer part of the National Forest road system, this section of the Dutch Miller Gap Trail occupies approximately 8.5 miles of the former NFS Road 56 roadbed and still provides motorized access for authorized individuals including private landowners and individuals with active mining claims. Approximately 22 federal mining claims are active in the area, roughly half of which are within the designated river corridor. Mining activity in the area is generally concentrated on specimen-quality quartz and other minerals. The sounds of blasting and the sights of temporary camps associated with mining activity may be noticed along the Dutch Miller Gap Trail or the Middle Fork Trail.

Current conditions

2017 dispersed site surveys along the Middle Fork Trail detected only two backcountry campsites in this section, none of which had evidence of human waste. Overnight use in this section outside of activities from mining claimants is mostly confined to individuals camping at the privately-owned and managed Goldmyer Hot Springs. The conditions of long-term encampments associated with mining claims in this corridor is not known. There are no known infestations of riparian or aquatic invasive plant species within this river section.

More than half of the area in this section is within 100 meters of the roadbed-trail or Middle Fork trail, and essentially the entire area is within 500 meters of those same features. This suggests a greater potential for recreational activity to affect the functional value of these habitats for wildlife. The variety of activity types (i.e., occasional blasting, authorized vehicle traffic, and other mining activities) and multiple modes of travel on the Dutch Miller trail, roadbed and Middle Fork trails have implications for greater disturbance or displacement of wildlife, along with the potential for encounters. The presence of mountain bikes leads to a potential for greater disturbance as well as for surprise encounters with wildlife that have human safety implications. Observations of berry patches and bear sign along the trail indicate the potential for displacement from foraging areas as well as the potential for human-wildlife interactions. Wilderness trail

reports indicate that the number and incidence of dogs observed off-leash is mid-range compared to the other visitor use areas.

Factors for future visitation

Changes in management of private inholdings in or adjacent to this section could influence use levels. For instance, if Goldmyer Hot Springs were to increase or reduce the number of visitors per day from 20 people per day.

Visitation could rise if there were an increase in prospecting activity in the valley. If trail crossings were improved at Burnboot, Thunder, and Wildcat Creeks, we might expect an increase in use by equestrian and mountain biking visitors.

Figure 18 - Gravel bars in the lower reaches of Scenic Section #1.

Visitor use indicators

The primary indicators for monitoring visitor use impacts to river values in Section #1 of the Middle Fork Snoqualmie River Corridor include the following:

- The presence of unburied human waste and/or full privy where backcountry privies exist.
- The presence of unsecured food and garbage
- Reports of human-wildlife conflicts.
- Reports of wildlife being disrupted by visitors.
- The presence of off-leash dogs.
- Harlequin duck nest disturbance or abandonment.
- Trail condition at stream crossings.
- Dispersed campsite condition.
- Riparian or aquatic invasive plant occurrences.
- Evidence of social trails.

See the visitor use monitoring and management strategy (p. 58) for details about thresholds, monitoring protocols, and potential management responses.

Estimated capacity

Annual visitation to Scenic Section #1 is estimated at 16,104 visitors.[29] It is assumed that a significant portion of those visits represent individuals accessing the Goldmyer Hot Springs (up to 20 visitors per day or 7,200 annually) and other private inholdings and mining claims.

Most visitor use in this section occurs from people accessing the Dutch Miller Gap or Middle Fork Snoqualmie River trails leaving the Dingford Creek Trailhead. Individuals parking at the Dingford Creek Trailhead may also access areas outside of the river corridor, including the Dingford Creek Trail and Hester and Myrtle Lakes areas.

The estimated capacity for Scenic Section #1 is 16,500 visitors annually. This estimate reflects a desire to maintain current visitor use levels over time, assuming positive trends in visitor use indicators, and considers the following:

- There is no evidence that current visitor uses levels threaten the river values of recreation and fish.
- This section contains important spring and fall forage habitat for bears and the upper extent of potential elk winter range within 500 meters of road or trails. An increase in visitation could impact wildlife habitat values, especially given the high proportion of the area that is within proximity to existing trails and roads that are accessed by mechanized and motorized equipment.
- Road conditions will continue to be a limiting factor to increasing visitation.
- On-river use is very light. Visitation to this section is largely concentrated on the trail system. Improvements to stream crossings on the Middle Fork Trail could support an increase in utilization of the trail by equestrian and mountain bike users.
- Given the amount of area over which visitors could disperse, the maintenance of current visitation rates will allow for the desired primitive backcountry experience with low numbers of encounters with other visitors.

Middle Fork Snoqualmie River Scenic Section #2

Dingford Creek to Taylor River (RM 70-65)

Visitor Use Setting

There is minimal road and trail access to the river itself in this section. The stretch of NFS Road 56 in this section is a gravel road primarily suitable for high-clearance vehicles. For the most part, the road sits above the floodplain. On-river use is limited to a few dispersed sites popular for camping, swimming, fishing, or picnicking. This stretch of the river contains Class III whitewater rapids and several areas that may require portages. Boating use on this section is currently light.

[29] Baseline estimate was determined by looking at the three-year average (2017-2019) of cars driving the gravel road section of NFS Road 56. The three-year average of 6,441 vehicles was multiplied by 2.5, the average number of people per vehicle on the Mt. Baker-Snoqualmie National Forest according to the 2015 National Visitor Use Monitoring data.

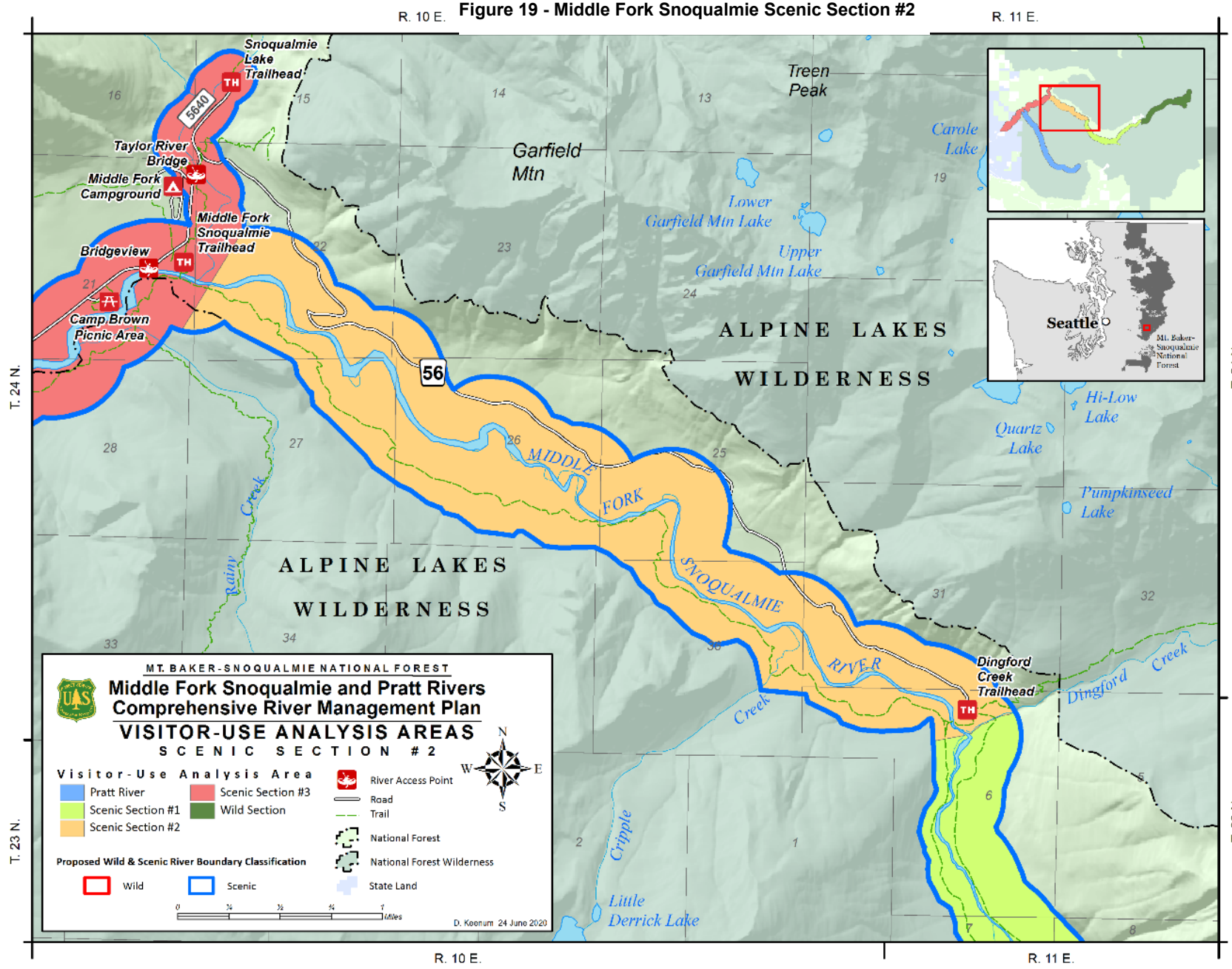
Dingford Creek Trailhead provides approximately 35 parking spots (this is most often used as a starting point for travel into Section #1). Pull-outs along NFS Road 56 are used for dispersed camping and some provide cross-country access to the river. Additional access is provided from the Middle Fork Trailhead which provides 100 parking spots. This section of the Middle Fork Snoqualmie Trail contains several known overnight campsites near the river. An annual trail running event brings up to 200 people at a time on the Middle Fork Snoqualmie Trail. An emerging activity in this stretch includes canyoneering at Dingford Falls on the Dingford Creek tributary. This highly technical activity is limited in scope and scale, occurring in summer months when creek volumes are low.

Current conditions

Landslides along the Middle Fork Trail have resulted in several re-routes and closures on this trail. Dispersed campsite inventories conducted in 2017 identified 21 campsites in this section, nine of which were less than 200 feet from the river's bank. Two of these river-side campsites were on the Middle Fork Snoqualmie Trail and the rest were located off the gravel road portion of NFS Road 56. Most of the sites had evidence of unburied human waste, several contained litter, and damage to vegetation. There are no known infestations of riparian or aquatic invasive plant species within this river section.

Nearly half of this area is within 100 meters of a road or trail and all is within 500 meters. Similar to Section #1, this suggests a greater potential for recreational activity to affect the functional value of these habitats for wildlife. The multiple modes of travel on the Middle Fork Trail have implications for greater disturbance or displacement of wildlife, along with the potential for encounters. The presence of mountain bikes, in particular, leads to a potential for greater disturbance as well as for surprise encounters with wildlife that have human safety implications. Like Section #1, reports of berry patches and bear sign along the trail indicate the potential for displacement from foraging areas as well as the potential for human-wildlife interactions. Habitat modeling shows a moderate amount of spring and fall bear habitat in this section.

Figure 19 - Middle Fork Snoqualmie Scenic Section #2



Factors influencing future visitation

The closure to dispersed camping in Section #3 along the paved portion of NFS Road 56 may cause displacement and increase overnight stays to areas accessed from this section of road.

Visitor use indicators

The primary indicators for monitoring visitor use impacts to river values in Section #2 of the Middle Fork Snoqualmie River Corridor include the following:

- The presence of unburied human waste and/or full privy where backcountry privies exist.
- The presence of unsecured food and garbage
- Reports of human-wildlife conflicts.
- Reports of wildlife being disrupted by visitors.
- The presence of off-leash dogs.
- Harlequin duck nest disturbance or abandonment.
- Dispersed campsite condition.
- Vehicles outside of designated parking areas.
- Riparian or aquatic invasive plant occurrences.
- Evidence of social trails.

See the visitor use monitoring and management strategy (p. 58) for details about thresholds, monitoring protocols, and potential management responses.

Estimated capacity

The baseline estimate for use in this section is 28,685 visitors annually.[30] The estimated capacity for Scenic Section #2 is 29,000 visitors annually. This range reflects a desire to maintain current visitor use levels over time, assuming positive trends in visitor use indicators, and considers the following:

- Trail-based recreation activities in this section are not thought to negatively affect river values of recreation and fish. However, an increase road and trail use could impact wildlife values due to the proximity of these features to important forage and habitat.

- Modes of travel such as mountain bike can have greater impacts as well as have greater potential to lead to human-wildlife conflicts.

- On-river use in this section is light and dispersed.

- Overnight use in this section may increase due to implementation of the dispersed camping closure in the downstream section. Action may be needed at existing dispersed campsites along the river to remediate concerns regarding human waste. Most of the areas available for road-side dispersed camping are sufficiently distant from the river. The river corridor could support this increase in visitation if management actions to reduce or eliminate impacts of dispersed camping were taken at campsites adjacent to the river

[30] Baseline estimate was determined by looking at the three-year average (2017-2019) of cars driving the gravel road section of NFS Road 56 as well as the average of five years of modelled visitation data from 2014-2018 for trail use on the lower Middle Fork Snoqualmie River Trail #1003. Use along the road corridor was estimated by multiplying the three-year average of 6, 441 vehicles was by 2.5, the average number of people per vehicle on the Mt. Baker-Snoqualmie National Forest according to the 2015 National Visitor Use Monitoring data. Trail use was estimated at 12,581 annual visitors.

and/or tributary streams. Dispersed camping areas overlap with spring forage habitat for bears, increasing potential for conflicts.

- Road conditions will continue to be a limiting factor for increasing use in this section.

Middle Fork Snoqualmie River Scenic Section #3

Taylor River to the downstream terminus (RM 65-57)

Visitor Use Setting

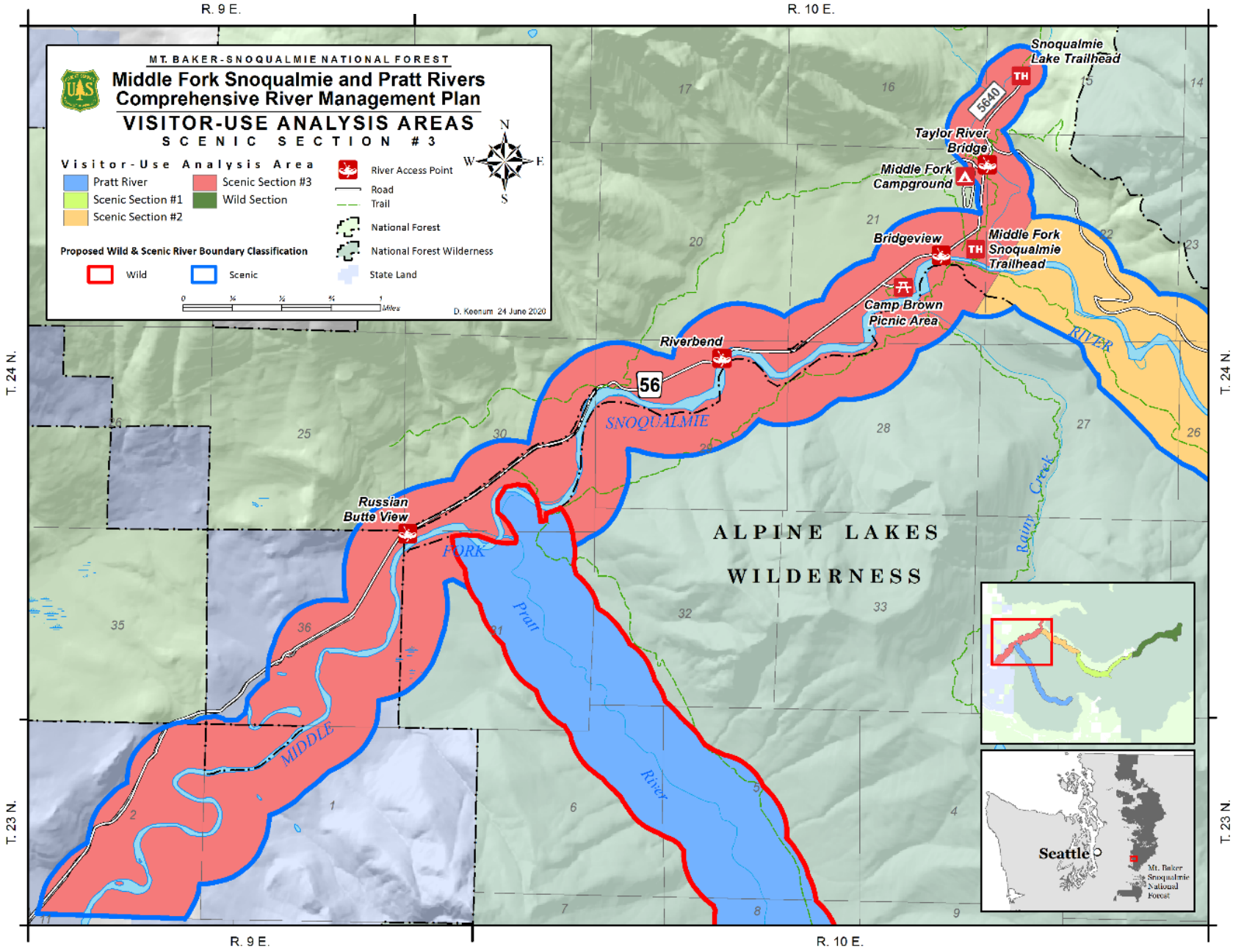
The paved Middle Fork Snoqualmie River Road (NFS Road 56) provides access to visitors year-round. Visitors to this river section are immersed in a natural setting with a moderate degree of infrastructure to accommodate heavier use June - August. Flows suitable for whitewater boating occur October through May.

This section features a well-known stretch of whitewater known as the “Upper Middle” containing Class II rapids and featuring scenic vistas dominated by the sheer granitic face of Mt. Garfield. Currently, one outfitter guide offers a limited number of float trips on the river and there are several recreation events for runners and road bikers that utilize portions of the river corridor within this section. This section is popular for fly-fishing, swimming, and picnicking during the summer months.

Figure 20 - Trail bridge near the Middle Fork Snoqualmie Trailhead.

The Middle Fork Snoqualmie Trailhead is the hub of concentrated recreation activity in this section, providing a picnic area and staging ground for visitors accessing the Middle Fork Trail and the Pratt River Trail as well as connector trails to the CCC Trail, Middle Fork Snoqualmie Campground, and the new Garfield Ledges Trailhead and picnic area on the Taylor River.

Figure 21 - Middle Fork Snoqualmie Scenic Section #3



Downriver, several formal and informal access points provide day-use and/or dispersed camping along the river. The Camp Brown Picnic Area is currently being developed for day-use picnic amenities and barrier-free access to the river. Pratt Bar and Russian Butte View are other sites available for picnics, swimming, fishing, and enjoying the river. The lower 3.25 river miles flow through lands managed by King County Parks and Washington Department of Natural Resources (DNR). DNR recently developed the Oxbow Loop Trail, a barrier-free interpretive boardwalk along a remnant oxbow lake.

Current conditions

The 2017 dispersed campsite inventory identified 49 roadside dispersed campsites in this section. Concentrated use at heavily-used dispersed campsites raises concerns about water quality and fish habitat due to lack of sanitation facilities and impacts to riparian vegetation and streambank erosion.

User conflicts have been reported where dispersed camping occurs at sites that would otherwise be used for river access. Over half of the sites contained evidence of human waste and all but one campsite was within 200 feet of the river. Since the 2017 inventory, two areas with highly concentrated dispersed camping have been rehabilitated, converted to day-use picnic areas, and now have bathrooms. Development of the Camp Brown area and the new Garfield Ledges Trailhead at the Taylor River resulted in the rehabilitation and removal of approximately 14 campsites. The dispersed camping closure along the paved portion of NFS 56 and up the first mile of the Taylor River will prohibit overnight use at the remaining sites.

Two species of invasive riparian plants have been identified in this river section, including reed canary grass (*Phalaris arundinacea*) and jewelweed (*Impatiens capensis*). The reed canary grass infestation is mapped within a 31.8 acre corridor along the NFS Road 56 from approximately Russian Butte View to the Taylor River Bridge. An infestation of jewelweed has been identified within a 2-acre area downstream of Camp Brown. An additional infestation of jewelweed is found within a 24-acre area of the Middle Fork Snoqualmie Natural Resources Conservation Area at the downstream terminus of the river corridor.

Due to use patterns and infrastructure relative to available habitat, recreational use in this section has the highest potential for wildlife-human conflicts and disturbance or displacement of wildlife. However, the accessibility and level of developments also affords greater management opportunities to utilize site design, deliver effective education, and maintain sufficient enforcement presence to counter or prevent impacts to wildlife. When roughly 8 river-miles are included for recreational disturbance buffering (based on current river channel location) as with roads and trails, this section has over 50 percent of area is within 100 meters of roads, trails or river-travel, and 100 percent of the areas is within 500 meters. WDFW surveys documented Harlequin ducks within this section, although they likely occur elsewhere as well. River-based recreational activities along this section (e.g., rafting, kayaking, etc) have the potential to disturb nesting ducks (Rockwell et al 2018) as well as other species using the riparian floodplain habitats. This is the section where the majority of the potential human-bear conflicts occur, likely influenced by the location of the recreation sites and the road itself relative to quality bear habitat. Habitat modelling shows a comparatively higher amount of spring and fall bear habitat overall. Indeed, FSR 56 passes through quality spring bear habitat in this section, and bears have been observed feeding near the road. A small amount of area managed as mountain goat winter range also occurs in the Taylor River portion of this section. This section is considered deer and elk

winter range although the elk habitat model also shows areas of summer elk forage along the corridor.

Visitor use indicators

The primary indicators for monitoring visitor use impacts to river values in Section #3 of the Middle Fork Snoqualmie River Corridor include the following:

- The presence of unburied human waste and/or full privy where backcountry privies exist.
- Dispersed campsite condition.
- Vehicles outside of designated parking areas.
- The presence of unsecured food and garbage.
- Reports of human-wildlife conflicts.
- Reports of wildlife being disrupted by visitors.
- The presence of off-leash dogs.
- Harlequin duck nest disturbance or abandonment.
- Riparian or aquatic invasive plant occurrences.
- Evidence of social trails.

See the visitor use monitoring and management strategy (p. 58) for details about thresholds, monitoring protocols, and potential management responses.

Estimated capacity range

Annual visitation to Scenic Section #3 is estimated at 97,968 visitors.[31] The estimated capacity range for Scenic Section #3 is 97,968 – 117,562 visitors annually. This range reflects a potential for a minimal increase (up to 20% growth) in visitation overtime, assuming positive trends in visitor use indicators, and considers the following:

- Many visitors drive or walk through this section in order to access upland areas and/or upstream sections. The visitor capacity accounts for the estimated through-travel to other areas of the valley, even if that visitation is not expected to directly impact river values. For example, the Middle Fork Snoqualmie Campground is outside of the Wild and Scenic River boundary and can only be accessed by travel through this section.

- Facilities in this section have been designed to accommodate visitation above current levels. Design features on the paved section of NFS Road 56 discourage parking outside of designated areas. Restrooms are available throughout Section #3 and parking lots are rarely at capacity. The development class of trails in this section are designed to sustain a greater degree of traffic. This section is most accessible for regular patrols for education and enforcement as well as regular operations and maintenance activities.

- Steps have already been taken to address major concerns about human waste at dispersed campsites. Many campsites have already been converted to day-use only areas, new toilets have been installed, and the remaining roadside dispersed campsites in this reach will be closed under the dispersed camping closure.

[31] Baseline estimate was determined by looking at the three-year average (2017-2019) of cars driving NFS Road 56 past the Forest Boundary. The three-year average of 39,187 vehicles was multiplied by 2.5, the average number of people per vehicle on the Mt. Baker-Snoqualmie National Forest according to the 2015 National Visitor Use Monitoring data.

- Concerns regarding erosion at river access points have been addressed at Camp Brown and additional work has been proposed for the river access site known as Bridgeview. Additional work is needed to assess conditions at river access points in this reach.

- The lack of a formal access point for hand-carried boats may be a limiting factor for on-river use but could be addressed by a proposed boat launch at Bridgeview. It is assumed that there is capacity for on-river use by boaters, anglers, swimmers, and other visitors in this section if the river access points are maintained to protect the integrity of the surrounding riparian habitat. However, increased on-river use could lead to greater potential for disruption of nesting and nest abandonment for Harlequin ducks, as well as greater impacts on other species using this riparian habitat.

- A substantial increase in visitation could impact wildlife values, especially given the high proportion of the area that is within relatively close proximity to existing trails and potential impacts posed by the different modes of travel.

- Work is underway to install bear-resistant food storage and garbage receptacles in the campground and at other recreation sites. It is assumed that these steps will reduce or eliminate wildlife habituation to anthropogenic food sources and garbage.

Implementation and Monitoring

Visitor Use Monitoring and Management Strategy

The following section will guide ongoing monitoring of visitor use impacts to river values and indicates potential management responses when thresholds are exceeded. Management responses are listed in the order in which they generally would be considered. Typically, management responses begin with education and employ more direct approaches if trends do not improve. However, severe or acute problems warrant more immediate and direct management solutions such as site modification or regulatory strategies such as area closures or entry permits. Selection of the appropriate management response is dependent upon site characteristics, visitor use patterns, and the severity of resource concerns. Management responses may be subject to NEPA before implementation can occur.

Table 4 - Summary of Visitor Use Monitoring Indicators

Indicator		River Value			
		Water Quality	Fish	Recreation	Wildlife
All sections	Unburied human waste and/or full privy (where backcountry privies exist)	x		x	x
	Reports of human-wildlife conflicts			x	x
	Reports of wildlife disruption				x
	Reports of unsecured food and garbage			x	x
	Presence of off-leash dogs				x
	Riparian or aquatic invasive plant occurrences	x	x		
	Evidence of social trails	x	x	x	x
Wild	Wilderness campsite scores	x		x	x

Scenic	Dispersed campsite condition	x		x	x
	Vehicles outside of designated parking areas			x	
	Trail condition at stream crossings			x	
	Recreational rock dams		x		
	Harlequin duck nest disturbance or abandonment				x

Indicators for all Pratt and Middle Fork Snoqualmie River Sections

Indicator: Unburied human waste and/or full privy (where backcountry privies exist)

River Value(s): Water quality, recreation, wildlife

Threshold: Presence of two or more unburied human waste deposits during at least two field visits per season. Alternate threshold: need to relocate full privy more than 1x per season.

Rationale: A proliferation of unburied human waste within 200' of streambanks or shorelines could degrade water quality, and can affect wildlife. A full privy suggests that use may exceed capacity to manage waste. The presence of more than one deposit over more than one visit suggests that there may be an unmet need for privies and/or visitor education. Moving privies more than once a year could become unsustainable due to lack of suitable locations and/or capacity to maintain toilets.

Monitoring Protocol: Evaluate presence of unburied human waste and privy condition during routine field ranger visits at least four times per season.

Potential Management Responses:

- Field rangers educate visitors about using established privies or toilets or proper waste burial techniques (where privies are unavailable).
- Increase signage at trailheads.
- Dig additional privies located closer to areas of concentrated visitor use.
- If additional privies are not possible, implement composting toilets or institute a pack-it-out program.
- Implement campsite closures and/or relocation from streambanks or shorelines (no closer than 200').

Indicator: Reports of human-wildlife conflicts

Observed habituated or food-conditioned wildlife.

River Value(s): Wildlife, recreation

Threshold: One or more reports of habituated or food-conditioned animals, attacks or other close encounters between wildlife and visitors in a specific area. Management actions (hazing, relocation, removal) taken against wildlife by WDFW or other entities should precipitate urgent action.

Rationale: Wildlife that are habituated or tolerant of human presence are not always indicative of a problem, but close proximity to humans could lead to undesirable behaviors such as humans approaching wildlife or vice versa. Any reports of food-conditioned animals indicate that undesirable human behavior (i.e., direct feeding or unsecured food or garbage) has likely occurred and indicates a need for increased vigilance and action before the situation escalates. Actions taken against wildlife by WDFW or others in a public safety capacity indicate undesirable wildlife behaviors which may have been caused or encouraged by undesirable human behaviors.

Monitoring Protocol: Reports of behaviors indicative of habituated/tolerant, or food-conditioned animals by public, concessionaires, partner agencies, etc.

Potential Management Responses:

- Increase signage at trailheads, campgrounds, and other adjacent facilities and provide similar information on the MBS NF web social media accounts, as well as to other sources of information for visiting public.
- Consider temporary or permanent campsite or trail closures and/or relocation where there are reoccurring conflicts or disturbance.
- Adjustments to types of allowable trail uses.
- Seasonal limitations to specific uses or seasonal closures of roads or trails.
- Limited entry permits to reduce overall visitation numbers and/or adjust timing of visits.

Indicator: Reports of wildlife disruption

Observed disruption or displacement of wildlife by visitors

River Value(s): Wildlife

Threshold: One or more reports of disrupted animals within a localized area.

Rationale: When wildlife are displaced by visitors from important seasonal habitats or disrupted while foraging, nesting, denning, tending to offspring or carrying out other critical activities, it is an indicator of potentially deleterious effects on health and well-being, especially when recurrent.

Monitoring Protocol: Reports or observations made by staff, partners or the public which include details that suggest animals fled or reacted due to the presence or activities of visitors or their dogs. Movements of instrumented or marked animals in relation to human activities or remote camera studies along the trail systems may also provide information on displacement or disturbance.

Potential Management Responses:

- Increase signage at trailheads, campgrounds, and other adjacent facilities and provide similar information on the MBS NF web social media accounts, as well as to other sources of information for visiting public.
- Consider temporary or permanent campsite or trail closures and/or relocation where there are reoccurring conflicts or disturbance.
- Adjustments to types of allowable trail uses.
- Seasonal limitations to specific uses or seasonal closures of roads or trails.

- Limited entry permits to reduce overall visitation numbers and/or adjust timing of visits.

Indicator: Reports of unsecured food and garbage

River Value(s): Wildlife, recreation

Threshold: Observation of unsecured food or garbage during any field visits or related reports by visitors.

Rationale: Any unsecured anthropogenic food sources for wildlife can quickly lead to food-conditioning and future conflicts that could lead to the removal of the animal, or human injury. Therefore, any instances where unsecured food or garbage is noted becomes cause for concern and preventative action.

Monitoring Protocol: Evaluate presence of unsecured food & garbage, as well as reports indicative of human-wildlife conflicts, during routine field ranger visits at least four times per season.

Potential Management Responses:

- Establish and enforce a food storage order and prohibition against feeding wildlife.
- Field rangers educate visitors about proper food and garbage storage along with other conflict-avoidance measures.
- Increase signage at trailheads and other adjacent facilities and provide similar information on the MBS NF web social media accounts, as well as to other sources of information for visiting public.
- Install IGBC-approved bear-resistant food lockers and trash cans wherever feasible. For backcountry locations, consider other methods and means to encourage proper storage (i.e., bear hangs, bear cans).
- Implement temporary or permanent campsite closures and/or relocation where there are natural food sources or other habitat features that naturally attract wildlife.

Indicator: Presence of off-leash dogs

River Value(s): Wildlife

Threshold: Presence of dogs off-leash during any field visits or reported by public.

Rationale: Dogs, especially when off-leash, can increase the potential for displacement and disturbance of wildlife during feeding, caring for off-spring, and other important activities, and can increase the potential for human-wildlife conflicts.

Monitoring Protocol: Evaluate presence of dogs off-leash during routine field ranger visits at least four times per season, as well as from accepted reporting processes.

Potential Management Responses:

- Field rangers educate visitors about the impacts of dogs, especially free ranging, on wildlife.

- Increase signage at trailheads, campgrounds, and other adjacent facilities and provide similar information on the MBS NF web social media accounts, as well as to other sources of information for visiting public.
- Establish and enforce consistent leash requirements across all river sections and not just on a trail-by-trail basis.

Indicator: Riparian or aquatic invasive plant occurrences

See Appendix B for a list of local riparian and aquatic plant species of concern.

River Value(s): Water quality, fish

Threshold: Detection of new infestations or growth or spread of existing infestations

Rationale: Riparian and aquatic invasive plant species are known to degrade water quality and disrupt natural function of riparian ecosystems. Early response to growth and/or spread of existing infestations and new invader species prevents infestations from growing so rapidly that treatment becomes unmanageable.

Monitoring Protocol: Routine field assessments by botany program staff. Observations from partner organizations or volunteers.

Potential Management Responses:

- Temporary site closures where needed to allow for treatment.
- Education and enforcement regarding weed free feed for stock use.
- Education and signage regarding proper cleaning of boats, clothing, gear and equipment for recreational boating and fishing.

Indicator: Evidence of social trails

River Value(s): Water quality, fish, recreation, and wildlife

Threshold: Observation of 1 or more social trails causing erosion at a developed recreation site, dispersed campsite, river access site, or along a trail corridor.

Rationale: Erosion and compaction from unmanaged recreation causes delivery of sediment to the river and degrades the function of riparian areas, can degrade wildlife habitat elements and even lead to trampling of nests or less-mobile wildlife species. Social trails attract additional visitor use and expand over time, increasing bank instability and erosion. Social trails also broaden the potential spatial extent of disturbance and lead to less predictability in human behavior, both of which can increase impacts. The recreational experience is improved when confusing and unsightly user-trails are limited.

Monitoring protocol: Field staff make observations during routine site visits.

Potential Management Responses:

- Use signage and site design to direct visitors to established trails and/or designated river access points.

- Implement trail or site design features or improvements that could discourage off-trail use.
- Close and rehabilitate river access points or social trails that cause unacceptable resource damage.
- Evaluate drivers for social trail use to determine root cause of use patterns. Where legitimate or unavoidable access needs exist (for example access to a water source from a campsite or a path to a scenic overlook), consider constructing or formalizing select routes to bring trail to standard, limit resource damage, and reduce redundancy in user-trails.

Indicators for Wild Sections of Pratt and Middle Fork Snoqualmie

Indicator: Wilderness campsite condition scores

Monitor condition scores at all campsites in the Middle Fork Wild Section and for all campsites within 200' of streambanks or shorelines within the Pratt River corridor.

River values(s): Water quality, recreation, wildlife

Threshold: Increase of campsite impact score by 2 points or an overall score of 6 points or higher out of 8 points.

Rationale: Campsite condition scores per wilderness site monitoring protocol suggests deteriorating resource conditions. Monitor all sites within the Middle Fork Wild Section because campsite condition is an indicator for the recreation river value. Focus on sites within 200' of water within the Pratt River Section because the management emphasis is on protecting water quality. Impact score increases may reflect negative trends in conditions.

Monitoring protocol: Follow wilderness campsite monitoring protocols at 5-year intervals. Assess for trends.

Potential management responses:

- Information at trailheads.
- Increased wilderness ranger contacts.
- Reroute trails away from lakes or sensitive areas.
- Prohibit stock in campsites.
- Restrict camping near lakes, streams, and meadows.
- Prohibit campfires in specific areas.
- Limit party sizes.
- Length of stay limit in problem areas.
- Rehabilitate damaged areas.
- Campsite closure.
- Campsite permits.
- Entry quota system.

Indicators for Scenic Sections #1-3 Middle Fork Snoqualmie

Indicator: Dispersed campsite condition

River section (s): Section #1-2

River value (s): Water quality, recreation, wildlife

Threshold: Incident report filled for conditions at dispersed campsite.

Rationale: Closure of dispersed camping opportunities in Scenic Section #3 could increase overnight use at sites along the river in Section #1 and #2, causing undesirable impacts to riparian conditions and increase in unburied human waste. Incident reports are filled when extensive litter, unburied human waste, or other negative resource conditions are observed.

Monitoring protocol: Routine field inspections may result in incident reports if conditions are severe. Annual dispersed campsite condition monitoring will occur in Section #2, where dispersed camping is more likely to occur due to road access.

Potential management responses:

- Increased education and enforcement.
- Establish privies or vault toilets where human waste is a concern.
- Conversion of campsites to designated dispersed campsites.
- Site closures.
- Rehabilitation of problem areas.

Indicator: Vehicles outside of designated parking areas

River section (s): Section #2-3

River value (s): Recreation

Threshold: Vehicles outside of designated parking areas are indicators of use exceeding infrastructure capacity. Overflowing parking lots can result in resource damage to riparian and wetland areas along shoulders of the road and may indicate that the desired recreation experience for uncongested parking lots may not be met. Desired conditions for the recreation river value call for uncrowded, uncongested parking lots, in contrast to other areas along the I-90 corridor.

Monitoring protocol: Field staff conduct parking lot counts during routine patrols. Data from self-reported parking lot counts from visitors to trailheads may supplement this information.

Potential management responses:

- Increase awareness through signage and field contacts about restrictions limiting parking to designated sites only.
- Increase enforcement patrols.
- Consider options to support shuttle or other alternative transportation if other indicators suggest that use levels are not problematic (i.e. thresholds not exceeded).
- Consider options to limit number of cars in the valley during peak use.
- Assess options for additional parking areas, where appropriate.

Indicator: Trail condition at stream crossings

River section (s): Section #1

River value (s): Recreation

Threshold: Where bridges exist, bridge inspection failure or rated as "not safe". Where fords occur, signs of erosion and/or indications that ford does not meet trail design standards.

Rationale: Desired conditions for recreation allow for the accessibility of amenities by a diversity of users and abilities. Bridges and fords that do not meet standards for hikers, equestrians, and bikers reduce accessibility and increase safety hazards. Bridge inspections indicate a need for maintenance or replacement. Erosion or damage to ford indicates a need for maintenance and/or redesign of the crossing.

Monitoring protocol: Scheduled bridge inspections every 3-5 years. Fords examined during rapid trail condition assessments every 1-2 years.

Potential management responses:

- Repair or replacement of trail crossing.
- Where fords are not to standard for horses: adjust approach to bank and modify substrate and debris, where appropriate.
- Relocate trail crossing to suitable location.

Indicator: Recreational rock dams

River section (s): Section #3

River value (s): Fish

Threshold: Observation of 1 or more rock dam.

Rationale: Rock dams and other structures left in the river or streams can become a migration and/or reproductive barrier to fish. Juveniles could become trapped as flows recede, fish could be excluded from rearing areas, the configuration of insects and inputs from riparian trees could be affected, and redds could be constructed in what has become a less stable area and be scoured or buried.

Monitoring protocol: Field staff make observations during routine site visits.

Potential management responses:

- Dismantle rock dam.
- Information posted or signed at access points.
- Field rangers and/or volunteers educational contacts.
- Relocate river access points from spawning habitat, where needed.

Indicator: Harlequin duck nest disturbance or abandonment

River Value(s): Wildlife

Threshold: Observation/reports of disturbance to nesting ducks or nest abandonment.

Rationale: Harlequin ducks are highly sensitive to disturbance during the nesting and brood-rearing period. Abandoned nests may lead to a loss of that year's reproductive effort and repeated disturbance can lead to longer term abandonment of the nesting area and impacts to local population.

Monitoring Protocol: Reports or observations made by staff, partners or the public which include details that suggest disturbance of nesting ducks or abandonment of nests due to the presence or activities of visitors or their dogs.

Potential Management Responses:

- Survey and monitor rivers for nesting activity in cooperation with WDFW and other partners. Identify nesting areas for protection and monitoring.
- Monitor boating activity as it pertains to the nesting and brood-rearing season.
- Implement limits on commercial permits for boating in areas where it would overlap with nesting areas and seasons.
- Cancel or defer improvements that would increase boating access, such as at Bridgeview, until there is more information available on the potential conflicts between boating and harlequin duck. Considerations may include:
    - Proximity of harlequin duck nesting habitat to river access points and/or areas where boaters are likely to land or pass close to shore.
    - The overall magnitude/extent of nesting habitat (i.e. is it possible to avoid conflicts).
    - Overlap between nesting and brood-rearing season and optimal flows for river running.
- Field rangers and/or volunteers educate visitors on how to avoid impacts.
- Increase signage at river access points and other adjacent facilities and provide similar information on the MBS NF web social media accounts, as well as to commercial outfitters and other sources of information for boating public.

Management Action Priorities

Section 10(a) of the Act requires river-administering agencies to protect and enhance the river values. In order to help the Forest meet this requirement, the comprehensive river management plan includes one immediate management action (Table 5 - Immediate management action) to address known impacts to river values. In addition to the potential actions identified in the visitor use monitoring and management strategy (p. 58), the Forest identified several priority management actions to advance stewardship of river values (Table 6). Where applicable, potential management actions will require additional development of a proposed action and site-specific analysis including NEPA. Many of the management actions are also subject to securing the necessary funding and/or partners for implementation.

On-going management activities that protect and enhance river values include the beaver restoration effort, the treatment of invasive species along the road corridor, and routine operations and maintenance activities to keep roads, trails, and other facilities maintained to standard.

Table 5 - Immediate management action

River	River Value Enhanced or Protected	Management Action
Middle Fork Snoqualmie	Water quality, Recreation	Closure to dispersed camping within a ¼ mile of the road. Area includes Middle Fork Snoqualmie River Road/NFS Road 56 from the Forest boundary to junction with NFS Road 5640 and up NFS Road 5640 to Snoqualmie Lake Trailhead.
Middle Fork Snoqualmie and Pratt	Wildlife	Update and improve messaging to public on how to reduce the potential for human-wildlife conflicts and disturbance or displacement impacts on wildlife. Target trailhead kiosks, campgrounds and other sites, internal and external social media platforms related to relevant outdoor recreation.

Table 6 - Priority management actions

River	River Value Enhanced or Protected	Management Action
Middle Fork Snoqualmie	Wildlife	Install bear-resistant food storage lockers at Middle Fork Snoqualmie Campground. Evaluate and test options for backcountry bear-resistant food and garbage storage. Install vent cap screens on all outhouses to reduce entrapment potential.
Middle Fork Snoqualmie and Pratt	Wildlife	Implement food storage order and prohibition against feeding wildlife.
Middle Fork Snoqualmie	Water quality, Recreation	River access improvements at Bridgeview, approximately 200 yards downstream of the Middle Fork Trailhead. Contingent upon inventory and assessment of impacts to harlequin duck nesting habitat and utilization downstream of Bridgeview.
Middle Fork Snoqualmie	Wildlife	Survey and monitor rivers for nesting activity in cooperation with WDFW and other partners. Identify nesting areas for protection.
Middle Fork Snoqualmie	Fish, free-flow, water quality	Restoration of large woody debris to improve channel complexity and habitat in the scenic river segment. Restoration of in-stream woody debris will consider best practices for design and placement in regard to boater safety. Additional analysis required.
Middle Fork Snoqualmie	Recreation, fish, water quality	Installation of trail bridges and/or improvement of fords on Middle Fork Trail #1003 across tributaries at Burnboot Creek, Thunder Creek, and Wildcat Creek.
Middle Fork Snoqualmie	Water quality, Recreation	Evaluate opportunities for designated dispersed and/or additional developed campsites in the lower river corridor (from the Forest boundary to approximately the junction with NFS Road 5640).
Pratt	Water quality	Evaluate and improve or restore, as needed, current campsites and toilets near Melakwa Lakes to maintain or improve water quality and riparian condition.
Middle Fork Snoqualmie and Pratt	Wildlife, Recreation	Manage Middle Fork Scenic Sections and Pratt consistent with winter range management strategies. This includes restrictions on motorized activities and other forms of disturbance in wintering areas, where needed, including seasonal road

		closures. Seasonal road closures may also provide enhanced opportunities for non-motorized recreation including cross-country skiing, snowshoeing, and road biking. Motorized access would be maintained for those with existing access rights including mining claimants and private land in-holders.
Middle Fork Snoqualmie	Wildlife	Evaluate opportunities for wildlife habitat restoration. Where feasible, improve wildlife habitat and foraging areas away from roads, trails, and other disturbances. In addition, identify priorities for sensitive habitat areas that would benefit from road or trail closures or reroutes.
Middle Fork Snoqualmie and Pratt	Fish, Wildlife	Expand beaver relocation efforts and evaluate potential beaver dam analog sites, if necessary.
Middle Fork Snoqualmie and Pratt	Wildlife	Conduct studies throughout the river corridors to evaluate impacts of recreation to wildlife habitat and populations.

Monitoring

This section identifies data collection that will inform assessment of river value conditions. Monitoring is important to ensure that changes stay within acceptable levels and do not compromise the protection and enhancement of the river values. Monitoring programs that are already being conducted for other management purposes were selected to help assure this monitoring plan is attainable. Several data gaps have also been identified.

For each river value to be monitored, one or more key indicators are selected that will allow managers to keep attuned to changes in the ecosystem or social setting. Sample methods can and should be changed if better means become available.

U.S. Forest Service, Region 6 Level II Stream Survey protocol

Periodic, recurring inventories are an integral part of the fish habitat and watershed management programs and form the foundation for effective program management. Inventories will identify existing aquatic and riparian conditions, identify factors limiting the productive capabilities of habitats, measure attainment of meeting stream habitat objectives, and help to assess cumulative watershed effects. The Pacific Northwest Region (Region 6) stream inventory is designed on a hierarchical scale to provide the user the opportunity to choose an inventory protocol which meets the data needs for the questions asked. The Level II is an extensive stream channel, riparian vegetation, aquatic habitat condition and biotic inventory on a watershed-wide scale. This level is to be used to determine the "pulse" or condition of a system during low flow conditions.

Surveys occur on a discretionary basis, subject to funding and priorities. The last Level II survey in the watershed occurred in 1996, however we are intending to have it resurveyed in2021 if conditions and funding allow. Surveys follow the protocol and data collection methods outlined in the Stream Inventory Handbook.

River values: Free-flow, water quality, fish
Indicators: channel form, presence and diameter of large woody material within channel, bankfull width and depth, unstable banks, riparian vegetation characteristics, pebble counts, and the presence of aquatic invasive species (flora and fauna).

Water Temperature Monitoring

Extensive research and monitoring conducted by member organizations of the Snoqualmie Science Coordination and Advisory Team (SnoSCAT) focuses on stream temperature within the Snoqualmie basin. After monitoring in 2015 revealed that the Middle Fork Snoqualmie River was reaching temperatures lethal to cold water fish, King County Department of Natural Resources and Parks and the WRIA 7 salmon recovery team partnered to begin collecting water temperature data throughout the mainstem and tributaries of the river. Researchers from the National Oceanic and Atmospheric Administration (NOAA) Fisheries and the U.S. Forest Service Pacific Northwest Research Station also established a network of thermistors throughout the Snoqualmie Basin. These projects follow water temperature monitoring protocols established by the Washington State Department of Ecology[32] and are expected to continue data collection for the foreseeable future.

A research study planned for the short term by USGS and Tulalip Tribes will utilize helicopter- and drone- mounted thermal infrared imagery (TIR) and drag probes on a section of the Middle Fork Snoqualmie downstream of Burnboot Creek. Additional TIR monitoring repeated on a 3-5-year basis could help track spatial changes and variability above and beyond the information provided by the existing thermistor network. TIR monitoring would be particularly informative for monitoring restoration actions such as beaver reintroduction and/or placement of large woody debris.

River values: Water quality, fish
Indicators: Water temperature

Water Quality

The King County Department of Natural Resources and Parks periodically monitors benthic macroinvertebrates to observe stream health on the Middle Fork Snoqualmie River. King County's Benthic Index of Biotic Integrity (B-IBI) includes ten metrics that measure different aspects of stream biology, including taxonomic richness and composition, tolerance and intolerance, habit, reproductive strategy, feeding ecology, and population structure. Results are available on the Puget Sound Stream Benthos website, www.pugetsoundstreambenthos.org.

River values: Water quality, fish
Indicators: Water temperature

Fish Populations & Habitat

Currently, the WDFW does not conduct regular monitoring of the fish populations within the Middle Fork Snoqualmie and Pratt Rivers. Several sources have identified goals related to improving understanding of trout species in the watershed.

WDFW's Snoqualmie River Game Fish Enhancement Plan identified research objectives for fieldwork to support the Plan and defined study tasks designed to improve the knowledge of game fish populations and fish habitat in the Upper Snoqualmie River Watershed (all three forks), as well as to collect useful information for management of the fisheries. Overman (2008) in his synthesis of existing data for the Plan, concluded that the most evident data gaps in the study

[32] Washington State Department of Ecology, "Continuous Temperature Sampling Protocols for the Environmental Monitoring and Trends Section". Publication No. 03-03-052, December 2003. Available: https://fortress.wa.gov/ecy/publications/documents/0303052.pdf

tasks were behavioral data such as instream movement and spawning behavior, and a rigorous age and growth analysis. Six indicators and associated tasks are particularly relevant for future monitoring with the river corridors:

1. ***Relative Trout Abundance*** – Density and abundance estimates are outdated and surveys did not always differentiate among trout species. New species-specific density estimates should be obtained using more rigorous mark-recapture techniques.

2. ***Trout Distribution*** – Trout distribution and species composition needs to be reassessed in each fork and in the major tributaries to the forks using data collected with a variety of fisheries techniques.

3. ***Trout Movement*** – Radiotagging efforts are needed to assess whether trout exhibit extensive instream or among-fork movements including seasonal transitions to summer feeding stations, overwintering areas, and spawning sites.

4. ***Trout Reproductive Life History –*** Spawning surveys, radiotagging, and redd capping are needed to assess current spawning distribution, habitat preference, spawning duration, and egg/alevin incubation periods.

5. ***Age and Growth Studies*** – Rigorous age and growth analyses are needed for each salmonid species including mountain whitefish.

6. ***Creel Census*** – New creel surveys are needed to assess the current status of the fishery and to evaluate regulations affecting angler harvest and effort.

Recreation Monitoring

The Forest Service conducts National Visitor Use Monitoring (NVUM) every five years. NVUM results for the general forest area (GFA) encompassing the Middle Fork Snoqualmie and Pratt valleys provides data regarding visitor demographics, satisfaction, and trip characteristics. The Forest will also continue the local use of trail and traffic counters to monitor and model use levels over time. Additional monitoring measures for recreation are detailed in the visitor capacity analysis (p. 58).

Wildlife Monitoring

A number of entities periodically monitor wildlife populations or conduct research related to recreation impacts on wildlife that has implications for this area. The WDFW has conducted surveys for Harlequin ducks in this area in the past. The Upper Snoqualmie Valley Elk Management group has monitored elk movements and some of those animals have the potential to use the river corridors as well. University of Washington researchers initiated a pilot study to evaluate recreation impacts on wildlife and the Middle Fork Snoqualmie River corridor is one of the initial areas for study. The Tulalip Tribes have conducted beaver relocation in the watershed and have monitoring associated with that project. The Forest has initiated modeling efforts to inform collaborative elk recovery planning to support realization of treaty rights for tribal hunting. Additional monitoring is desired to better understand habitat utilization and populations for a variety of wildlife species including, but not limited to, harlequin duck and elk.

The following indicators and associated tasks are particularly relevant for future monitoring of wildlife values with the river corridors:

1. Relative use – Estimated abundance of elk fecal pellet groups at survey plots that will be distributed systematically throughout the river corridors. Account for seasonality, pellet decay rates, and probabilities for detecting pellet groups across the sampled space.

2. Proportion of area occupied (PAO) – Estimated based on a pattern of survey plots where elk sign is detected by observers.

3. Elk location tracking and disturbance monitoring – Where possible, leverage existing efforts or support new monitoring efforts for elk or other species to include animals that could use the river corridor. Track patterns of elk and other wildlife use in relation to level of recreational use (via trail counter data) and types of activities.

4. Forage quality – Measure forage quality at pellet sampling, PAO plots or other systematically placed locations using established protocols.

5. Number of Harlequin duck breeding pairs and broods (per Visitor Use Area).

The above list is not exhaustive and additional research to monitor wildlife values will be encouraged.

Additional Monitoring

Several monitoring efforts occur irregularly within the river corridors but may provide important insights to river value conditions.

The U.S. Forest Service Regional Aquatic Riparian Effectiveness Monitoring Program (AREMP) evaluates riparian conditions on a randomized rotation. While plots are small, AREMP monitoring provides data regarding watershed conditions by combining field data with upslope and riparian information. The primary purpose of AREMP is to determine the current condition of 6th-field watersheds and track changes in watershed condition over time. AREMP was developed to fulfill monitoring requirements of the Aquatic Conservation Strategy in the Northwest Forest Plan, approved in 1994.

The National Best Management Practices (BMP) program was developed to improve management of water quality consistently with the Federal Clean Water Act (CWA) and state water quality programs. BMPs are specific practices or actions used to reduce or control impacts to water bodies from nonpoint sources of pollution, most commonly by reducing the loading of pollutants from such sources into storm water and waterways. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants to receiving waters. Monitoring of BMPs occurs randomly throughout the river corridors and addresses facilities, recreation, roads, minerals, fire management, aquatic ecosystems, and vegetation management. Additional information about BMP monitoring is available at https://www.fs.fed.us/naturalresources/watershed/bmp.shtml.

Appendix A: River Values Assessment

The following comprises River Values Assessment released in the fall of 2018, subsequently updated with additional analysis after considering information received from Tribal consultation and public comment.

Wild and Scenic Rivers Act Requirements

Enacted in 1968, the Wild and Scenic Rivers Act (the Act) (16 U.S.C. 1271-1278) preserves selected rivers and their immediate environments in free-flowing condition in order to protect them for the benefit and enjoyment of present and future generations. The Act requires river-administering agencies and other federal agencies to protect and enhance the values for which the river was designated. The following statutory provisions highlight this "protect and enhance" mandate:

> *Section 10(a): Each component of the national wild and scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting its aesthetic, scenic, historic, archeologic, and scientific features. Management plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.*

Rivers designated by the Act possess outstandingly remarkable values that may include one or more of the following: "scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values" (Section 1(b)). In order to be assessed as outstandingly remarkable, a river-related value must be a unique, rare, or exemplary feature that is significant at a comparative regional or national scale. Dictionary definitions of the words "unique" and "rare" indicate that such a value would be one that is a conspicuous example from among a number of similar values that are themselves uncommon or extraordinary.

While the spectrum of resources and opportunities that may be considered is broad, all values should be directly river-related. That is, they should:

- Be located in the river or on its immediate shorelands (generally within a quarter mile on either side of the river);
- Contribute substantially to the functioning of the river ecosystem; and/or
- Owe their location or existence to the presence of the river.

This evaluation uses the criteria developed by the Interagency Wild and Scenic Rivers Coordinating Council and incorporated into agency policy (Forest Service Handbook 1909.12, Chapter 82.14) to evaluate river values and determine the outstandingly remarkable values associated with a designated river. The determination that a river area contains outstandingly remarkable values is a professional judgment on the part of an interdisciplinary team, based on objective, scientific analysis.

The Act also requires the administering agency to establish a detailed river corridor boundary to protect river values. Boundaries must include an area of an average of not more than 320 acres per river mile, unless otherwise specified in the designating legislation (Section 3(b), Section

10(a)). Section 4(d) of the Act specifies that until boundaries are officially established for designated rivers, an interim boundary will be in effect, generally comprising "that area measured within one-quarter mile [or greater if identified in the authorizing legislation] from the ordinary high water mark on each side of the river" upon designation. A final detailed boundary will be developed during the planning process for the Comprehensive River Management Plan. For this report, the interim boundaries are being used.

Evaluation Process and Criteria

The river values evaluation is an important first step in the development of the comprehensive river management planning process. The evaluation must take into consideration all features, which are directly river-related, and helps provide a holistic approach to investigating the relationship of river features. There are three components to the river values evaluation process: 1) determine the region of comparison; 2) establish the evaluation criteria for each outstandingly remarkable value; and, 3) confirm or determine the outstandingly remarkable values for each segment. This report will discuss each of these components in the following sections.

The forest convened an interdisciplinary team in April 2018 to begin the river values evaluation process. Members of the team included specialists in the following areas: botany, hydrology, geology, fisheries, recreation, wildlife, scenery, and archeology.

Region of Comparison

The region of comparison for the evaluation is the western slopes of the North Cascades in the U.S., from approximately the South Fork of the Snoqualmie River north to the U.S.-Canadian Border. Residents of the Greater Seattle metropolitan area as well as the nearby communities of North Bend and Snoqualmie are considered local users to the river corridors. The Snoqualmie, Tulalip, and Muckleshoot Tribes are considered important local users of this area of the forest. Users coming from other locations in Washington are considered regional users.

Previous Identification of Outstandingly Remarkable Values

The Forest Service evaluated all rivers that were included in the Nationwide Rivers Inventory for suitability and eligibility for inclusion in the Wild and Scenic Rivers System. Appendix E of the 1990 Final Environmental Impact Statement for the Mt. Baker-Snoqualmie Land and Resource Management Plan (Forest Plan) includes the eligibility of the Middle Fork Snoqualmie and Pratt Rivers. The eligibility findings for the river segments are summarized in Table 7.

Table 7 - Summary of Forest Plan FEIS Appendix E for Recommended Wild and Scenic Rivers

River	Outstandingly Remarkable Values
Middle Fork Snoqualmie River	Recreation, Wildlife, and Fisheries
Pratt River	Recreation, Geological, Fisheries, Wildlife, and Ecological

Since the 1990 Forest Plan, the Forest Service adopted more rigorous minimum thresholds in the Forest Service Handbook (FSH 1909.12, Chapter 82.14). The following assessment utilizes the updated criteria. The outstandingly remarkable values identified in Appendix E were reviewed and validated or refined, as discussed in the Evaluation Process and Criteria section of this report.

Outreach for River Values Assessment

In 2018, the Forest conducted outreach to tribes, stakeholders, and members of the public to help identify important river values. We hosted two open house meetings, utilized a collaborative web-based map, and collected comment letters during an extended pre-scoping period from September 2018-March 2019. We received 16 comments on the collaborative web map and nine formal comment letters by email from organizations and individuals. Nearly 30 individuals from a variety of organizations participated in a half-day workshop to identify river values. Participants included representatives from Tulalip Tribes, Snoqualmie Tribe, Washington Department of Fish and Wildlife, King County Natural Resources, Washington Department of Natural Resources, Snoqualmie Watershed Forum, City of North Bend, University of Washington/Burke Museum, Northwest Wilderness Programs, Mountains to Sound Greenway Trust, Washington Trails Association, Backcountry Horseman of Washington, Friends of the Issaquah Fish Hatchery, Alpine Lakes Protection Society, American Whitewater, and Valley Camp.

River Values Assessment

The following sections document the interdisciplinary team's findings regarding water quality, free-flowing condition, and the determination of outstandingly remarkable values in the Middle Fork Snoqualmie and Pratt Wild and Scenic Rivers. This assessment was updated in 2021 after considering additional information regarding wildlife values.

Cultural Values & Treaty Rights

Indigenous people have been living in the region of the Middle Fork Snoqualmie and Pratt Rivers since time immemorial. The cultural values assigned to the rivers and resources in the Middle Fork Snoqualmie Valley by Native American Tribal members transcend categorization and evaluation with outstandingly remarkable value criteria. Although the Forest Service did not assess and rank these cultural values for "outstandingly remarkable value", the agency is committed to its trustee role to maintain the treaty rights and federally-protected rights of Tribes who value and utilize the Middle Fork Snoqualmie and Pratt Wild and Scenic Rivers. Under no circumstance does the "outstandingly remarkable value" of another resource outweigh the importance of federally-protected Tribal rights.

The historic diaspora of tribal members to various reservations and extensive familial associations throughout the region connect members of the Snoqualmie, Yakama, Tulalip, Muckleshoot, and Puyallup tribes to the area. The river corridors are within the "open and unclaimed lands" for purposes of treaty-reserved hunting and gathering for tribes who signed the Point Elliott Treaty of 1855.

Pre-Contact & Historic Values

Human use can be broken into two periods— pre-contact and historic. The pre-contact period covers the millenia when the area was inhabitated by American Indians before Euro-American contact and settlement. The historic period covers early contact between American Indians and Euro-Americans and Euro-American uses. Cultural resource sites located within the river corridors reflect the various uses during these eras.

Evaluative Criteria

Sites must have rare or unusual characteristics or exceptional human interest values. Sites may have national or regional importance for interpreting ethnography; may be rare and represent an area where a culture or cultural period was first identified and described; may have been used

concurrently by two or more cultural groups; or, may have been used by cultural groups for rare or sacred purposes. The river or area within the river corridor contains sites or features associated with a significant historic event, an important person, or a cultural activity of the past that was rare, unusual, or one-of-a-kind in the region. Historic sites or features in most cases are 50 years old or older. Of particular significance are sites or features listed in, or are eligible for inclusion in, the National Register of Historic Places.

Pre-historic Values along the Middle Fork Snoqualmie & Pratt Rivers

There are no known significant pre-contact sites that would fit the criteria of an outstandingly remarkable value along the Middle Fork Snoqualmie and Pratt Rivers. While pre-contact sites have not been identified, that does not preclude the presence of Traditional Cultural Properties, traditional use areas, or sacred sites of importance to members of tribes of this region. One traditional use was identified within the Middle Fork Snoqualmie drainage in the outdated 1981 publication "Inventory of Native American Religious Use, Practices, Localities and Resources." This individual use may not qualify as an outstandingly remarkable value but is indicative, however, of the potential for cultural significance placed on the valley by local tribal members. No significant archaeological sites or traditional cultural properties are known in the corridor.

Historic Values along the Middle Fork Snoqualmie and Pratt River

There are no known significant historical sites that qualify as outstandingly remarkable values within both river corridors.

The dominant historical features within both river corridors originate from the North Bend Lumber Company and the North Bend Timber Company railroad logging operations from 1923 through 1939. Extensive construction and timber removal created a historical landscape of railroad grades, artifact scatters, rail sidings, and distinctive second growth stands that define the forest conditions along the wild and scenic corridor. However, the timber camps were temporary, and the tracks were removed in 1941. Road-based logging overran much of the earlier features and decay has removed the rest.

Old mining relics left near a trail signpost near Dutch Miller Gap. Photo by David Fothergill.

While some signs of historical logging remain as well as homesteads and ranger stations along the Middle Fork Snoqualmie, the features lack the integrity to contribute significantly to defining the characteristics of the wild and scenic river. Only one site within the corridor was determined to be eligible for the National Registry of Historic Places (NRHP), the Taylor River Ranger Station. It was last recorded in 1986 but has since been reclaimed by the forest.

Recreation

Evaluative Criteria

Fishing in the Middle Fork Snoqualmie River. Photo by Tom O'Keefe

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

Middle Fork Snoqualmie River

Recreation was found to be an outstandingly remarkable value of the Middle Fork Snoqualmie River corridor.

Diverse recreation opportunities exist both on and next to the Middle Fork Snoqualmie River corridor, including whitewater boating, fly fishing, swimming, picnicking, horseback riding, hiking, backpacking, camping, mountain and road biking, hot spring soaking, and rock climbing. The sights and sounds of the river features prominently in the recreation experience even for those activities that are not dependent upon the water.

While many of the recreation opportunities present in the river corridor are also available throughout the region of comparison, the year-round accessibility of the river corridor stands out as unique. The low elevation of the valley, proximity to a major metropolitan area, and accessibility by paved road stands out in the region of comparison for many recreation activities.

The Middle Fork Snoqualmie River and tributaries currently offer year-round opportunities for catch-and-release fishing for cutthroat trout and other game fish, including, where many other trout fisheries in the North Cascades are closed seasonally due to the presence of anadromous fish. The Middle Fork is one of only a few Cascade streams that is regulated as catch-and-release year-round, with no open harvest period for any game fish at any time of year. The rest of the Snoqualmie River above the falls has seasonal restrictions that allow some harvest.

The trailhead for the Middle Fork Trail #1003 and the Pratt River Trail #1035 is a paved public parking area designed for general recreational passenger vehicles as well as accommodating pull-through access and parking for trailers. This trailhead facility stands out as an exemplary amenity on the west side of the North Cascades, where safe trailer access for stock is limited. The section of the river from Taylor River to the bridge at Granite Creek, just downstream from the terminus of the wild and scenic designation, is known by boaters as the "Upper-Middle". This scenic whitewater run contains class I-II rapids and is considered an exceptional run for beginners due to the ease of egress to the Middle Fork Snoqualmie Road. Goldmyer Hot Springs, located on a private inholding on the Burnboot Creek tributary, attracts visitors from all over the world. The

hot springs are not only regionally uncommon but are also unique in form, as they flow from a horizontal mine shaft where visitors soak in a cave-like setting before the water pours into pools below.

Pratt River

Recreation was not found to be an outstandingly remarkable value of the Pratt River.

The 1990 eligibility study identified an outstandingly remarkable value for recreation based on heavy hiking use near Tuscohatchie Lake, moderate hunting use near the mouth, and light fishing use. This evaluation does not find that these opportunities stand out as unique or exemplary in the region of comparison. Although the Pratt River Trail #1035 offers access to recreational opportunities along the river for both stock and hikers, the trail for the most part is out of sight and sound of the river and therefore recreation does not meet the basic criteria of river-dependent for the Pratt River. According to American Whitewater, the Pratt River rapids rate up to class IV and the river is seldom run by whitewater boaters because of its lack of accessibility.

Geology

Evaluative Criteria

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

Talus field along the Middle Fork Snoqualmie River. Photo by Andrew Graminski.

Middle Fork Snoqualmie River

Geology was not found to be an outstandingly remarkable value of the Middle Fork Snoqualmie River.

Comments received by the public suggested that the Middle Fork Snoqualmie valley may be unique for its extensive glaciolacustrine deposits of clay. However, evidence of glaciolacustrine deposits are common throughout the region of comparison. The river valleys of the western slopes of the North Cascades have largely been shaped by continental and alpine glaciation. While the Middle Fork Snoqualmie Valley is known to contain spectacular mineral specimens in the uplands, these minerals are not present within the river corridor.

Pratt River

Geology was not found to be an outstandingly remarkable value of the Pratt River.

The 1990 eligibility study identified a geological outstandingly remarkable value due to the presence of "clay formations called concretions… found in the river and along its banks in the lower stretches." However, the presence of clay concretions was not found to be unique or exemplary within the region of comparison.

Fish

Evaluative Criteria

Fish values may be judged on the relative merits of either fish populations, habitat, or a combination of these river-related conditions.

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

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

Middle Fork Snoqualmie & Pratt Rivers

Fish were found to be an outstandingly remarkable value of both the Middle Fork Snoqualmie and Pratt Rivers. Coastal cutthroat trout, rainbow trout, mountain whitefish, and sculpin species reside in the Middle Fork Snoqualmie and Pratt Rivers. Fish in these rivers have been cut-off from the downstream watershed since the last Ice Age due to the presence of Snoqualmie Falls, a complete barrier to anadromous fish. Although Sunset Falls on the South Fork Skykomish River is also a barrier to anadromous fish, the Washington Department of Fish and Wildlife (WDFW) manually transports fish around Sunset Falls. Fish upstream of Sunset Falls are not genetically isolated like those on the Middle Fork Snoqualmie and Pratt Rivers. Similarly, on the South Fork Stillaguamish River, a fish ladder installed at Granite Falls allows artificial assistance to salmonids migrating upstream. Though hatchery fish were stocked in the past into the Middle Fork Snoqualmie River, genetic analysis of the Middle Fork trout show predominantly native coastal cutthroat (Thompson et al. 2011a), and WDFW currently manages the Middle Fork (and the Pratt River, its tributary) as a wild trout resource (Thompson et al. 2011b). DNA analysis of the coastal cutthroat trout showed subpopulations to be genetically distinct in the main stem and tributaries of the Middle Fork Snoqualmie River (Latterell 2001). The relatively high levels of genetic diversity are expected to allow greater adaptability to changing environmental conditions. The presence of wild resident cutthroat trout, with their genetic diversity, are outstandingly remarkable on the Middle Fork Snoqualmie and Pratt Rivers.

Wildlife

Evaluative Criteria

Wildlife values may be judged on the relative merits of either terrestrial or aquatic wildlife populations or habitat or a combination of these conditions.

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

itself, lead to a determination of "outstandingly remarkable."

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

Middle Fork Snoqualmie & Pratt Rivers

Upon further review, wildlife was determined to be an outstandingly remarkable value of the Middle Fork Snoqualmie and Pratt Rivers. The 1990 eligibility study determined that wildlife was a remarkable value for both rivers due to the presence of spotted owls, elk, black-tailed deer, mountain goat, black bear and beaver, as well as the presence of deer winter range and excellent riparian and furbearer habitat. In particular, the current and future function and value of riparian habitat plays into this determination. Riparian forests are important nesting and foraging areas for a variety of birds, provide important refugia for amphibians and mollusks, and are seasonally important foraging areas for bats, bears, and ungulates. Old river channels, beaver ponds, wetlands, small ponds and other water bodies scattered throughout the river corridors provide herbaceous and woody browse and foraging for a variety of species, as well as insect prey for bats and birds, and open water foraging areas for aquatic-based wildlife.

Riparian systems such as those in the Middle Fork Snoqualmie River and Pratt River are expected have an even more important role as wildlife habitat under climate change scenarios due to their role in connecting habitats and ecological zones across elevational gradients, linkage from aquatic portions of the WSR to the terrestrial habitat, function as thermal refugia as a buffer against extreme temperatures (E.g., record-setting heat wave in 2021), and the natural resilience of riparian systems overall (Seavy et al. 2009).

Other influences on the habitat structure and function in the Middle Fork Snoqualmie and Pratt rivers include the substantial amount of historical timber harvest that occurred between 1929 and 1985, along with road and trail development.

Comments submitted by WDFW suggest that the rivers may be important for the harlequin duck, a species of concern for the State of Washington and a USFS Sensitive Species in the Pacific Northwest Region. Harlequin ducks use inland mountain rivers and stream systems and riparian vegetation for nesting, foraging, and brood-rearing (Rockwell 2018). WDFW documented multiple individuals of this species during surveys of the Middle Fork Snoqualmie River but was not able to document any nesting (C. Anderson, pers comm.). Still, WDFW specialists felt that it was likely that the species used the main Middle Fork Snoqualmie River channel and its tributaries for nesting. Harlequin ducks are sensitive to recreational activities and noise disturbance along streams and riparian areas during the summer nesting season, water quality-effects on prey availability during this same period, and factors generally associated with climate change (Rockwell 2018). WDFW noted the potential for high human visitation along these rivers due to the proximity a large urban population and the susceptibility of the species to disturbance (C. Anderson, pers. comm.). Rockwell (2018) provides recommended conservation measures that can be used to reduce potential habitat or disturbance-related impacts on this species.

The proximity of these river corridors to a large urban center provides both an exceptional opportunity for education and interpretation as well as a threat to the viability and integrity of

riparian habitats and dependent species. These combined factors make this riparian habitat and these species unique and notable within the region of comparison.

Botany & Ecology

Evaluative Criteria

Ecological values may be judged on the relative merits of unique or exemplary ecological communities or plant specimens of special interest within the river corridor.

Ecological communities: The river corridor contains notable ecological diversity and/or ecological communities considered to be unique or exemplary within the region.

Plant specimens: The river corridor contains nationally or regionally important specimens of native plant species. Of particular significance are species diversity, species considered to be unique, and/or populations of Federal or State-listed or candidate threatened or endangered species, or species of conservation concern.

Middle Fork Snoqualmie & Pratt River

Botany and ecology have not been found to be outstandingly remarkable values of the Middle Fork Snoqualmie and Pratt Rivers.

The 1990 eligibility assessment and additional analysis of potential river values in 2018 identified several elements as potential ecology outstandingly remarkable values: the glaciofluvial valley-western hemlock landform association in segments of the Middle Fork Snoqualmie, old growth habitat with potential for supporting rare plant species and communities in segments of both river corridors, and the presence of Sitka spruce/western hemlock (*Picea sitchensis/Tsuga heterphylla*) forest.

The Forest geologist determined the Glaciofluvial Valley-Western Hemlock landform association is rather common within the region of comparison and does not warrant inclusion as an outstandingly remarkable value for the project. Areas where this landform association occur are largely comprised of second growth forest with limited potential for supporting sensitive plant species.

Old growth along the Pratt River. Photo by Karen Sykes.

Pockets of old growth and individual old growth trees can be found within the glaciofluvial valley-Western hemlock landform association (and throughout the river corridor), but the habitat generally lacks the connectivity and size to function as true old growth forest. Areas where old growth trees persist received focused botany surveys during 2018 and 2019 field seasons. Surveys were conducted in summer/fall 2018 and spring/summer 2019 to account for variation in plant phenology. In general, areas containing old growth trees were supporting the same vegetation and plant communities as surrounding areas of second growth forest. One Category C Survey & Manage species (*Platanthera orbiculata*) was observed within areas of old growth, but occurrences were not confined to these old growth pockets. *Platanthera orbiculata* (large round-leaved orchid) is well distributed across the MBS, found in damp, rich humus in deep shade of heavily forested areas on sites with varying moisture regimes, and is not limited to occurring under any particular tree species or age class. Field surveys determined the areas containing old growth have a greater potential for supporting sensitive plant species than second growth forest, but no sensitive plant species were observed occurring exclusively in association with these areas. Within the region of comparison, small pockets of old growth and scattered individual old growth trees are not uncommon. For this reason, along with the lack of river-dependent sensitive plant species, the areas of old growth occurring within the project area are not determined to be an outstandingly remarkable value.

The presence of Sitka spruce (*Picea sitchensis*) as far inland as the project area was thought to be rather uncommon, as it is considered mostly a coastal species. Sitka spruce was initially considered as a potential ORV for the project. Preliminary analysis revealed that regional herbaria identify over 20 occurrences of Sitka spruce located as far inland (or further inland) as those in the project area, and consultation with other area botanists confirmed at least 10 other sites which are not represented in herbaria, with speculation of even more sites.

Further detailed analysis was conducted to assess the uncommonness of both Sitka spruce and glaciofluvial valleys, relative to the North Cascades region of interest. The analysis found the following:

- Sitka spruce is not restricted to Middle Fork Snoqualmie and Pratt Wild and Scenic River analysis area nor is it limited to glaciofluvial valleys, which are also present throughout the Forest.
- Sitka spruce is observed across a range of elevations, stand ages, and forest successional classes including old-growth forest patches to a varying degree throughout the Forest.
- Sitka spruce is found in similar, or higher, old growth concentrations in other river corridors across the Forest.

This analysis drew upon the following resources:

1. **Ecology plot data:** Of 9 ecoplots spanning all 4 districts, all contained Sitka spruce. The plots ranged in seral stage from sapling/young forest to older forest (+200 years old) and were distributed across a range of elevations and slope positions.

2. **Draft Regional Potential Natural Vegetation map products (PNV):** This mapping effort of potential vegetation types for the Pacific Northwest Region includes information from the Region 6 Ecology Plot monitoring program and modeled data from Forest Inventory and Analysis plots (here referred to as GNN dataset). This mapping analysis identified a distinct Sitka spruce vegetation zone and further defined two subzones (wet Sitka spruce and Sitka spruce wetland). The Sitka spruce vegetation zone as mapped is distributed across the entire forest.

3. **Old Growth Structure Index (OGSI):** This index was developed in the Northwest Forest Plan 20-year monitoring report for late successional-old growth forest report and is used to identify and show the distribution of structurally complex forests at two age thresholds (80-years and 200-years of age corresponding to those forest stands in which naturally successional process are trending toward or resulting in old-growth characteristics). Patches of OGSI at 80 and 200 are distributed across the forest in varying sizes.

4. **Landtype Association (LTA):** Landtype associations are spatial representations and classification of geomorphology and the resulting map products were used to look at the distribution of glaciofluvial valleys across the forest. This LTA is distributed across the forest and found in every ranger district on the MBS. Glaciolacustrine deposits are present throughout these LTAs.

Ecology plot data and PNV Sitka spruce data were overlaid with the OGSI and LTA spatial products to conduct a visual analysis of the distribution and abundance of the Sitka spruce vegetation type on the Mt. Baker-Snoqualmie relative to the Wild and Scenic River analysis area. Visual inspection confirmed that Sitka spruce is not restricted to the Wild and Scenic River area nor is it restricted to the glaciofluvial valleys. Furthermore, this vegetation type is observed across a range of stand ages and forest successional classes. While this type does not dominate the Mt. Baker-Snoqualmie, it is found to make up a component of old-growth forest patches to a varying degree. While this work does not address the distribution and abundance of individual tree size classes, it does demonstrate that Sitka spruce is found in a variety of structurally developing forest stands ranging from young previously managed stands to unmanaged old-growth in the Mt. Baker-Snoqualmie.

Some comments referred to a “rare plant association” of Sitka spruce and hazelnut within the planning area. While Sitka spruce and hazelnut both exist within the planning area, there is not a recognized Sitka spruce/hazelnut plant association in Washington or Oregon, as classified by the Region 6 Ecology program. The Field Guide to the Forested Plant Associations of the Mt. Baker-Snoqualmie National Forest contains a full list of recognized plant associations specific to this forest, available here: https://ir.library.oregonstate.edu/concern/defaults/ks65hd96c.

The Washington Natural Heritage Program (WNHP) recorded a historical site labeled as a Sitka spruce/western hemlock plant community that overlaps a small portion of the Middle Fork Snoqualmie river corridor Additionally, WNHP notes a small current site, labeled as a Sitka spruce/swordfern plant community and has a state ranking of imperiled. Associated species include hazelnut (*Corylus cornuta*), as well as bigleaf maple, salmonberry, and Oregon grape. This site is not within, or immediately adjacent, to the river corridor.

No other botany or ecology outstandingly remarkable values were identified during 2018/2019 surveys, nor were any new sensitive plant species occurrences (*P. orbiculata* was already known from the project area).

Scenery

Evaluative Criteria

Landscape elements of landform, vegetation, water, color, and related factors result in notable or exemplary visual features or attractions. Additional factors, such as seasonal variation in vegetation, scale of cultural modifications, and the length of time negative intrusions are viewed, may be considered. Scenery and visual attractions may be highly diverse over different parts of the river or river segment. Outstandingly remarkable scenic features may occupy only a part of a river corridor.

The North Cascades region of comparison is an area widely recognized for its distinctive scenic quality. In considering the types of scenery that are unique, rare or exemplary in the North Cascades, additional criteria were considered to assist in the outstandingly remarkable value determination process. The criteria in Table 8 help identify what attributes are exemplary, unique, or rare in the region. They are based on concepts from the USFS Scenery Management System.

Table 8 - Additional criteria for scenery outstandingly remarkable values in the North Cascades

Attribute	Description
Distinctive waterfalls	Distinctive waterfalls are those that are a dominating scenic attribute of the river. Considerations include the type of waterfall, volume of water, vertical drop, and/or scarcity within the region of comparison.
Distinctive riverine geologic features	Surface geology, in or immediately adjacent to the river, is a dominating scenic attribute. Considerations include the shape, size, color and scarcity within the region of comparison of canyons and rock formations such as bedrock, boulders, cobble and gravel bars.
Distinctive pools	Distinctive pools are those that are a dominating scenic attribute of the river. Considerations include deep pools, waterfall plunge pools, blue holes and spring boils that are scarce within the region of comparison and possess unique water qualities such as color, clarity and reflections.
Glacially fed	The river is fed by active glacial processes and possesses unique attributes such as the jade color of glacial milk or other distinctive qualities that are scarce within the region of comparison.
Iconic views	The river is integral to the composition of iconic views of the western slope of the North Cascades. Considerations are rivers that substantially complement views of large, perennially snow-capped composite volcanoes, valleys and/or canyons that exemplify the region's scenic character.

Middle Fork Snoqualmie & Pratt Rivers

Scenery was not found to be an outstandingly remarkable value of the Middle Fork Snoqualmie and Pratt Rivers.

Summit Chief Mountain near Williams Lake. Photo by Andrew Graminski.

The waterfalls located within the interim corridor are scenic water features, especially Nellie Falls, but are the types of waterfalls that are typical to the North Cascades and lack the volume of water to be considered distinctive. The shape, size, color of the bedrock, boulders, cobble and gravel bars located inside the river corridor were typical of the region of comparison. Excluding the higher reaches of the wild sections, the surrounding river canyons are typically vegetated. Erosion resistant rock outcrops have formed cascade type waterfalls. However the geology within the interim corridor is not unique, exemplary or rare in the region of comparison. Many nice, picturesque pools are located within the interim corridor but are typical within the region of comparison. Spring boils and blue holes are not present. Deep pools and waterfall plunge pools lack the depth, color, and reflective qualities to be unique or exemplary. The river basins are landforms sculpted by glaciers, and one small glacier, Overcoat, is active within the watershed of the Middle Fork Snoqualmie – located between Overcoat Peak and Summit Chief. Overcoat Glacier is too small to create appreciable glacial processes that result in attributes such as the coloration of glacial flour or other distinctive qualities within the Middle Fork Snoqualmie River. There are many views of mountains and prominent landforms within the interim corridor, including the impressive granitic walls of Garfield Mountain. However, the prominent mountains and landmarks aren't considered iconic within the North Cascades which harbors perennially snow-capped stratovolcanoes such as Mt. Baker and Glacier Peak.

Water Quality

The Middle Fork Snoqualmie River is in exceedance of state standards for water temperature. High water temperature can be lethal or stressful to fish and other aquatic organisms, and may create or exacerbate other water quality problems such as low levels of dissolved oxygen. Waters that do not meet state standards (See Appendix B) are deemed water quality limited by the Washington State Department of Ecology (DOE). The DOE lists water quality limited bodies on the 303(d) list and establishes a Total Maximum Daily Load (TMDL). TMDLs determine total acceptable levels of degradation for a specific waterbody to meet water quality standards and recommendations for future management actions to improve temperature in the basin. River segments listed in the Snoqualmie River Watershed Temperature TDML within and adjacent to the Middle Fork Snoqualmie and Pratt Rivers are displayed in Table 9.

Table 9 - State of Washington 303(d) listed waters within the watersheds draining the Middle Fork Snoqualmie and Pratt River Wild and Scenic River corridors.

Impairment Listing #	Stream Name	Impairment Category (TMDL in place)	Miles
72540 (Temperature)	Unnamed Tributary to MF Snoqualmie	4A	3.0
72553 (Temperature)	Burnt Boot Creek	4A	2.3
72554 (Temperature)	Middle Fork Snoqualmie River	4A	9.8
72556 (Temperature)	Kimball Creek	4A	0.8
72557 (Temperature)	Unnamed Tributary to MF Snoqualmie	4A	10.1

Water quality monitoring conducted by the King County Department of Natural Resources and Parks, Water and Land Resources Division (KCDNR), has revealed temperatures exceeding state standards on a regular basis in multiple reaches of the Middle Fork Snoqualmie River. Additional recent monitoring (since 2018) at the mouth of the Pratt River also shows exceedance of state water quality standards.

A multi-agency, collaborative group has been investigating temperature issues on the Middle Fork for the past decade. The US Forest Service (USFS), National Oceanic and Atmospheric Administration (NOAA), and King County, Department of Natural Resources and Parks, Water and Land Resources (KCDNR) have been continuously monitoring water temperature in the Middle Fork since 2012. This data has been used to develop a statistical stream temperature model for the Snoqualmie basin.

Elevated water temperatures in the Snoqualmie Basin have been identified as a major impairment to the ecological health of the Snoqualmie-Snohomish Watershed and a major threat to its cold-water fishery. In the past, much of the efforts and conversation around restoration have focused below Snoqualmie Falls, where there is an intersection between migratory salmon (including the threatened Chinook and steelhead trout) and impaired habitat conditions. However, is estimated that approximately 60% of the combined flow from the three forks of the Snoqualmie comes from the Middle Fork. A study by King County during the hot, dry summer of 2015 showed that the temperatures observed in the Middle Fork fell within the temperature range observed downstream on the mainstem (Figure 22).

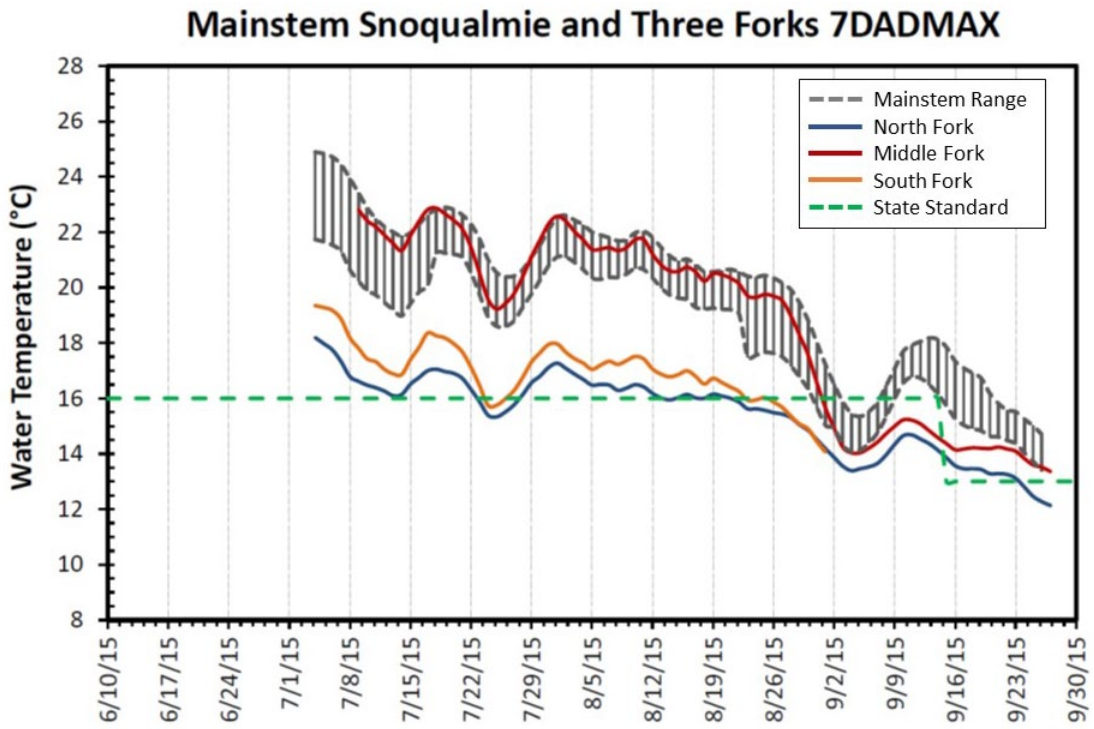


Figure 22 - Water Temperatures of the three forks of the Snoqualmie River basin during the summer of 2015 (KNDNR 2016)

While the stream temperature data collected in the past decade has not produced definitive resolutions to the exact cause of the temperature increase in the Middle Fork Snoqualmie, inferences can be made. Below is a conceptual model (Figure 23) of potential natural and anthropogenic causes of the Middle Fork's elevated water temperature (courtesy of King County WA DNR).

Within the Middle Fork Snoqualmie wild and scenic river corridor it's likely that the elevated temperatures are due to some combination of the factors described below. The upper Middle Fork watershed has natural hot springs that impact stream temperature (most notably the Goldmyer Hot Springs). Further, the shape and orientation of the Middle Fork valley naturally allows more sunlight to reach the stream channel.

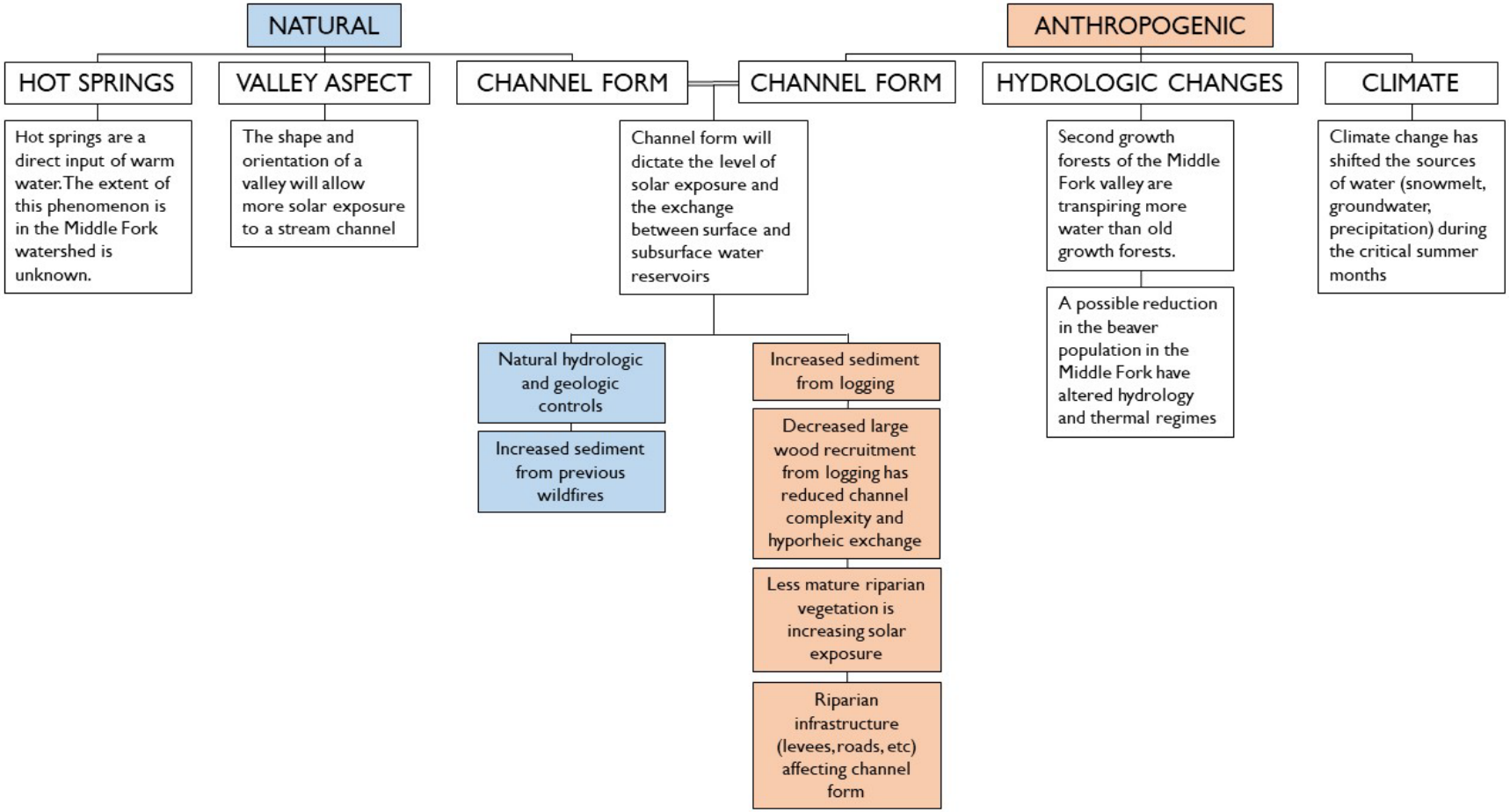


Figure 23 - Conceptual model of potential natural and anthropogenic causes of the Middle Fork's elevated water temperature (Provided by KCDNR)

These natural factors, along with historic logging of riparian areas and road building in the last century has created a second growth forest that lacks the shade capabilities of an old growth forest. Table 10 shows the estimated harvest acres and Figure 24 shows the approximate location of harvest within the Middle Fork Snoqualmie and Pratt Rivers river corridors since the beginning of the 20th Century.

A pool found in the upper reaches of the Middle Fork Snoqualmie River. Photo by Andrew Graminski.

Table 10 - Estimated acres of riparian areas harvested in the Pratt and Middle Fork Snoqualmie Wild and Scenic River corridors since 1900.

Year of harvest	Pratt River Wild Section (sq miles)	Middle Fork Snoqualmie Wild Section (sq miles)	Middle Fork Snoqualmie Scenic Section (sq miles)
1900-1938	2,195	0	3,333
1939-1948	646	0	0
1949-1958	0	0	0
1959-1968	0	0	0
1969-1978	0	0	111
1979-1988	0	0	16
1989-1998	0	0	0
1999-present	0	0	0
Total	**2,841**	**0**	**3,460**

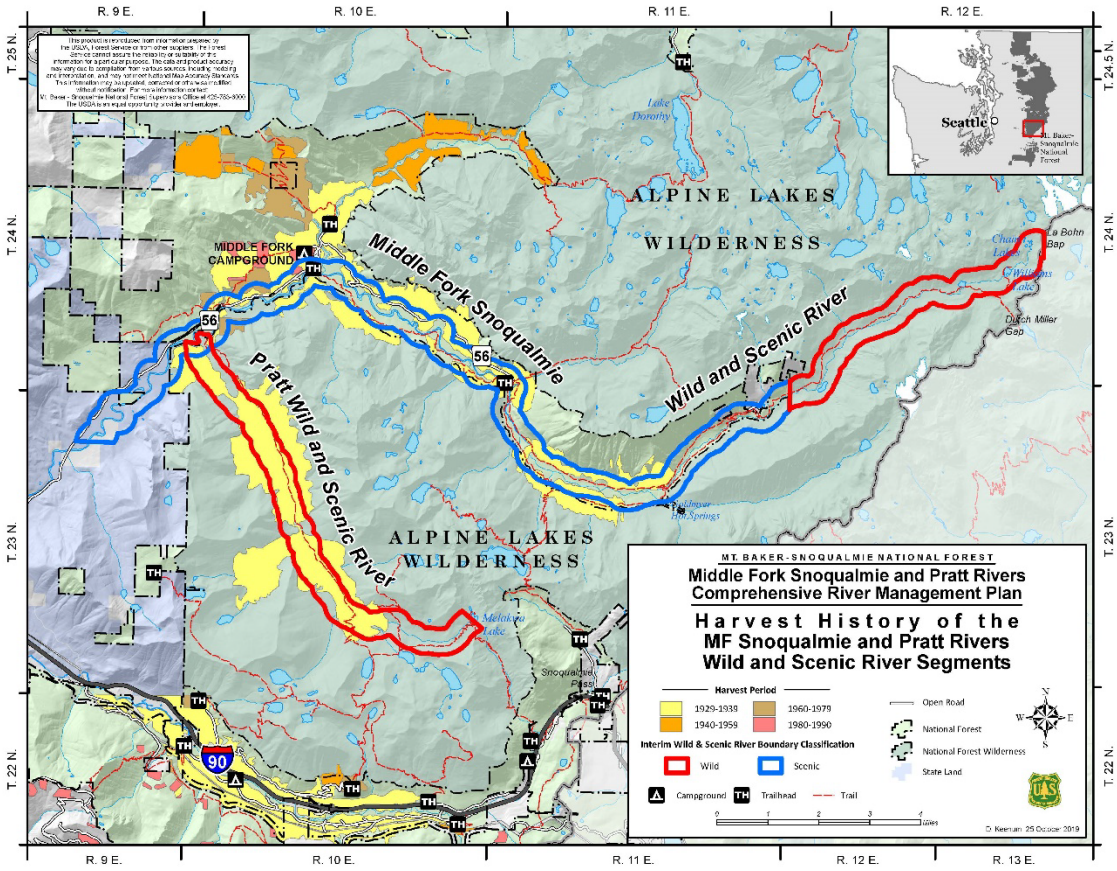


Figure 24 - Harvest history of WSR segments

While it's recognized that these harvest areas and timeframes are estimates, the riparian corridors in the Middle Fork Scenic and Pratt River Wild Sections were intensely harvested in the last century and these forested areas will not reach maturity for years and possibly centuries. The impacts to riparian areas from past harvest likely resulted in increased erosion and sedimentation, as well as decreased shade and a reduction in large wood recruitment to the channels.

The Middle Fork Snoqualmie River scenic section and the Pratt River are currently estimated to have wider and shallower stream channels than they may have had in the past. There is less large wood habitat in these reaches causing shallower pools, wider bankfull widths, and less hyporheic exchange (Scott and Wohl 2018, Fox and Bolton 2017). This reduced channel complexity creates more surface area for radiant heat to affect stream temperature. These anthropogenic modifications, along with climate change, and the natural aspect of the basin are likely contributing to the increases in temperature.

There are sections of the Middle Fork Snoqualmie River Road/NFS Road 56 and the Dutch Miller Gap Trail (formerly the NFS Road 56 road) along the Middle Fork Snoqualmie scenic section where the prism has impacted the channel by reducing channel migration and permanently removing riparian vegetation. These additional anthropogenic actions have impacted the Middle Fork Snoqualmie in similar ways that riparian harvest has, albeit to a lesser degree. This is discussed further in the free-flowing condition section of this report.

The Snoqualmie Temperature TMDL had the following key findings (as related to the Middle Fork Snoqualmie and Pratt wild and scenic rivers):

• Tributary streams provide cooler water to the mainstem river but most also consistently exceed state standards. These streams provide local cool water refugia where they meet the mainstem river.

• Over time, mature riparian vegetation needed to reduce solar radiation can also indirectly reduce stream temperatures by increasing channel complexity. Channel complexity generally increases recruitment of large woody debris, helps trap fine sediments, increases cool water pool formation, and increases exchanges between surface water and cooler groundwater. A natural fully functioning channel would be expected to have more sinuosity and braiding that would likely provide cooler stream temperatures.

• Hyporheic exchange flows and groundwater discharges are important to maintain the current temperature regime and reduce maximum daily instream temperatures.

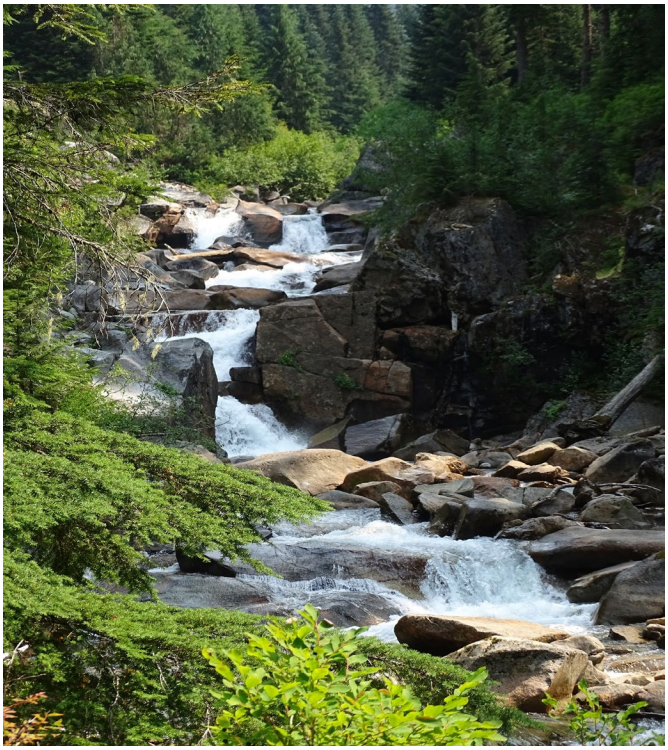
• Riparian restoration is essential. At a minimum, tributary streams need buffers that are both tall and wide enough to provide complete shade. Larger buffers would provide a cooler microclimate effects and could help reduce stream temperatures more efficiently. Tributaries with high salmonid use should be prioritized for restoration.

Lastly, water quality in Williams Lake in the headwaters of the Middle Fork Snoqualmie River has been found to contain toxic concentrations of copper according to a 1987 report cited in the Middle Fork Snoqualmie Watershed Analysis (1998). In the 1990's when the Forest Service acquired the lands containing the former copper mine at La Bohn Gap, above Williams Lake, there was discussion about whether the copper levels were naturally occurring in the lake or the result of previous mining activity. No additional research or monitoring has been completed. Due to the remote location and wilderness designation of these lands, no future mining is expected to occur at this site.

Free-Flow Conditions

Middle Fork Snoqualmie River

Scott and Wohl 2018 describe the Middle Fork Snoqualmie as, “a system that exhibits glaciogenic topography, with streams ranging from steep, debris flow-dominated headwater channels (wild section and the upper areas of the scenic section) to lower gradient, wide, laterally unconfined channels in its lower reaches (lower less confined area of the scenic section), and has been extensively logged in the lower elevation reaches.”



Cascades in the Middle Fork Snoqualmie River. Photo by David Fothergill.

Sixty tributaries drain into the Middle Fork Snoqualmie River. Major named tributaries related to the Wild and Scenic River Corridor include the Pratt River, Taylor River, Dingford Creek, and Burnboot Creek.

The Middle Fork Snoqualmie stream channel still has impacts from railroad logging operations from approximately 80 years ago. The overall hydrology of this system is intact with few impervious surfaces. Land management and fire has had limited to no impacts in many decades. An extensive amount of the upper watershed is located in the Alpine Lakes Wilderness, originally designated in 1976 and expanded to include an additional 22,000 acres in 2014.

Since 1961 United States Geological Survey (USGS) has operated a stream gauge, located approximately 1.5 miles downstream of the terminus of the Middle Fork Snoqualmie River scenic section and approximately 1.0 miles downstream of the Middle Fork Bridge.

The Middle Fork is a typical Westside Cascades hydrologic system. Figure 25 shows a hydrograph of the Middle Fork gage from 2018, a typical water year for the system. Autumn rains generally begin in late September/early October and go into December, when winter snow occurs more regularly and a snow pack develops in the higher elevations of the watershed. There is the potential for rain on snow and winter rain events as well. Freeze and thaw events can trigger spikes in the hydrograph at any time during the winter. Spring snowmelt and rains trigger spikes in the hydrograph from March until July when the flow drops significantly during the dry summer months. These summer months are when temperatures rise to levels which impact aquatic life.

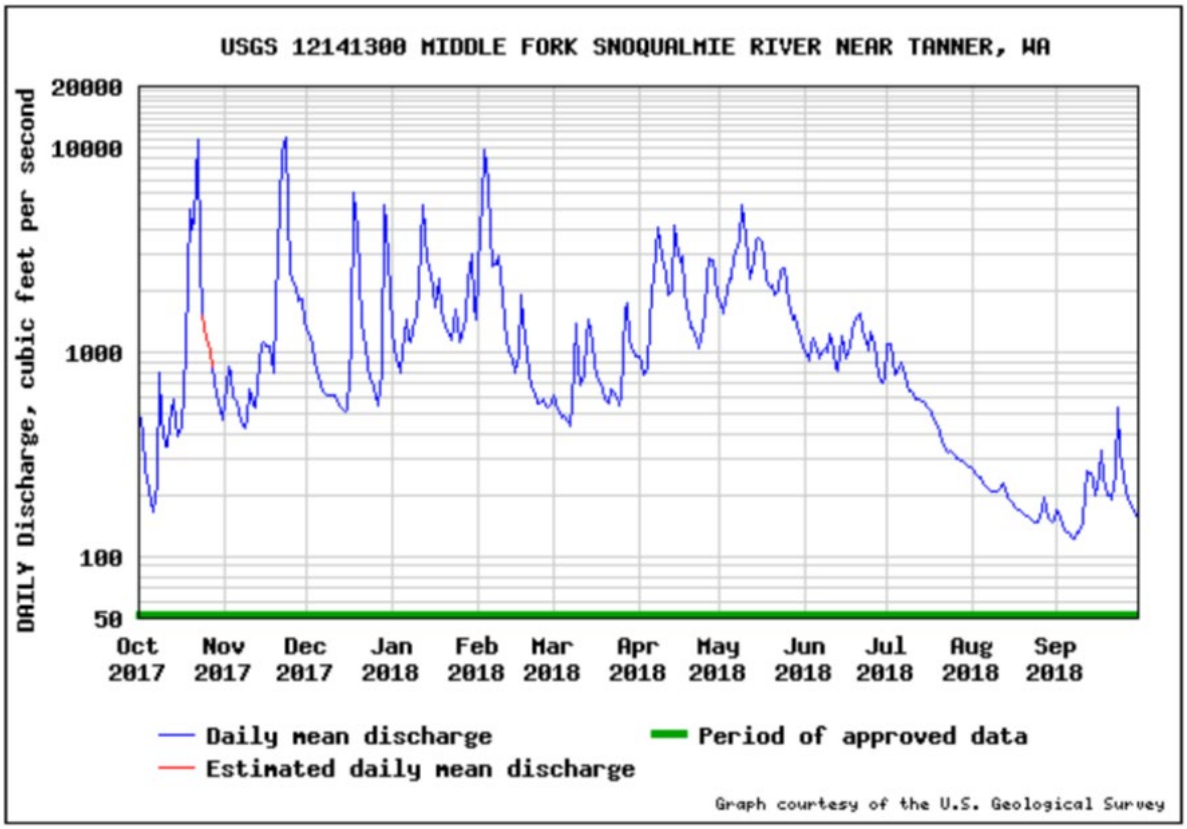


Figure 25 - Typical annual hydrograph of USGS stream gage 12141388, Middle Fork Snoqualmie River near Tanner, WA

Table 11 shows the flood frequency for the Middle Fork at the downstream terminus of the scenic section. This was deciphered by using the stream stats modeling program. The 100 year storm flow is estimated at 33,500 f^3/s while the 500 year event is estimated at 42,000 f^3/s.

Table 11 - Estimated flood frequency analysis of the Middle Fork Snoqualmie River and the terminus of the Scenic section.

Peak flood	Flow (cfs)
2 year	11,900
5 year	17,700
10 year	21,500
25 year	26,300
50 year	29,700
100 year	33,500
250 year	37,100
500 year	42,000

Development along the Middle Fork Snoqualmie River includes the Middle Fork Snoqualmie River Road/NFS Road 56, paved (2018) until it reaches Taylor River Bridge, where the road is gravel until the Dingford Creek Trailhead. At the Dingford Creek Trailhead, the former NFS Road 56 road is now Dutch Miller Gap Trail and this trail extends another 8.5 miles to the Dutch Miller Gap Campground. The newly paved Middle Fork Road impacts both the floodplain function and

eliminates the potential for riparian regrowth along certain northern stretches of the River. Figure 26shows one such location where the road has been hardened with riprap to protect road fill.

From aerial imagery, it is estimated that between 0.5-1.0 river miles are impacted along the paved stretch of the road. Additional sections of riprap occur along the now Dutch Miller Gap Trail.

Figure 26 - Example of rip rap that has been placed in the MF to protect the Middle Fork Road.

There are three major trail bridges that cross the Middle Fork Snoqualmie within the wild and scenic corridor which include the Middle Fork Snoqualmie Trail Bridge at the main trailhead, the bridge near the Dingford Creek confluence, and the bridge near Burnboot Creek confluence.

Pratt River

There is no current or historical flow data that exists specific to the Pratt River. The Pratt River contains lengthy reaches with moderate gradients and good pool-riffle conditions. Short stretches of rapids are common. The last documented major disturbance was in the 1940s (Table 10). Logging operations of the early 20th century created debris flow channels. Those impacts can still be seen today.

Table 12 shows the flood frequency for the Pratt River at the mouth of the watershed. This was deciphered by using the USGS stream stats modeling program. The 100 year storm flow for the Pratt River is estimated to be 8,620 f^3/s while the 500 year event is estimated to be 10,800 f^3/s.

Table 12 - Estimated flood frequency analysis of the Pratt River at its mouth

Peak flood	Flow (cfs)
2 year	3,100
5 year	4,610
10 year	5,590
25 year	6,810
50 year	7,680
100 year	8,620
250 year	9,530
500 year	10,800

There are no roads, trail bridges, or homes along the Pratt River. From field observation, there are only a few dispersed campsites along the Pratt River Trail. The hydrology of this river is intact with no impervious surfaces.

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Appendix B: State Water Quality Standards

The water quality of Washington's streams, lakes, estuaries and groundwater is monitored by the Washington Department of Ecology (DOE). Water quality standards are established by State and Federal law and codified into the Washington Administrative Code (WAC 173-201A). The WAC includes both narrative and numerical water quality criteria, as well as an anti-degradation policy. The policy strives to maintain the highest possible quality for Washington's waters, while allowing for limited amounts of degradation by human activities that are deemed necessary and in the "overriding public interest" (WAC 173-201A-300).

The water quality standards define the types of uses and activities that the public has a right to expect from the lakes, rivers, streams and marine waters of the State. These 'beneficial use' categories (e.g., water supply, recreation, aquatic life) form the cornerstone of the State's water quality standards. When standards are not met, the risks to certain beneficial uses reach levels that are deemed unacceptable.

The table below lists the beneficial use categories that apply to the Middle Fork Snoqualmie and Pratt River corridors, as defined in the WAC (WAC 173-201a). The uses are divided into Aquatic Life, Recreation, Water Supply and Miscellaneous categories.

Table 13 - Beneficial uses, applicable standards and associated water bodies for the Middle Fork Snoqualmie and Pratt River Wild and Scenic River corridors (adapted from WAC 173-201a)

Aquatic Life Uses	Standards	Waters
Char spawning and rearing. The key identifying characteristics of this use are spawning of early juvenile rearing by native char (bull trout and Dolly Varden), or use by other aquatic species similarly dependent on such cold water. Other common characteristic aquatic life uses for waters in this category include summer foraging and migration of native char; and spawning, rearing, and migration by other salmonid species.	**Temperature.** (7-DADMax) 12°C. **Dissolved oxygen.** (1-DMin) 9.5 mg/L **pH.** Shall be within the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.2 units. **Turbidity.** Turbidity shall not exceed: 5 NTU over background when the background is 50 NTU or less; or 10 percent increase in turbidity when the background turbidity is more than 50 NTU.	Middle Fork Snoqualmie above and including Dingford Creek (at RM 26). Includes all tributaries above the confluence. Middle Fork Snoqualmie's tributaries at longitude -121.5629 and latitude 47.5389. Pratt River (at Middle Fork Snoqualmie RM 16) and all tributaries.
Core summer salmonid Habitat. The key identifying characteristics of this use are summer (*June 15 - September 15*) salmonid spawning or emergence, or adult holding; use as important summer rearing habitat by one or more salmonids; or foraging by adult and sub adult native char. Other common characteristic aquatic life uses for waters in this category include spawning outside of the summer	**Temperature.** (7-DADMax) 16°C. **Dissolved oxygen.** (1-DMin) 9.5 mg/L **pH.** Same as above. **Turbidity.** Same as above.	Middle Fork Snoqualmie and tributaries from mouth to Dingford Creek (RM 26).

Aquatic Life Uses	Standards	Waters
season, rearing, and migration by salmonids.		
Salmonid spawning, rearing, and migration. The key identifying characteristic of this use is salmon or trout spawning and emergence that only occurs outside of the summer season (September 16 - June 14). Other common characteristic aquatic life uses for waters in this category include rearing and migration by salmonids.	**Temperature.** (7-DADMax) 17.5°C. **Dissolved oxygen.** (1-DMin) 8.0 mg/L **pH** shall be within the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.5 units. **Turbidity.** Same as above.	All surface waters in the Middle Fork Snoqualmie.
Recreational Uses	**Standards**	**Middle Fork Snoqualmie Waters**
Extraordinary quality primary contact waters. Waters providing extraordinary protection against waterborne illness.	**Bacteria**. Fecal coliform organism levels must not exceed a geometric mean value of 50 colonies/100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 100 colonies/100 mL.	All waters listed above as Char Spawning and Rearing *and* Middle Fork Snoqualmie from mouth to Dingford Creek. All other surface waters not listed above or under the extraordinary quality primary contact water criteria.
Primary Contact Recreation	**Bacteria.** Fecal coliform organism levels must not exceed a geometric mean value of 100 colonies /100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 200 colonies /100 mL.	
Water Supply Uses **Domestic Water, Industrial Water, Agricultural Water and Stock Water.** All surface waters in the Snoqualmie basin are listed as providing all four beneficial water supply uses:		
Miscellaneous Uses **Wildlife habitat, Harvesting, Commerce/Navigation, Boating, Aesthetics.** All surface waters in the Snoqualmie basin are listed as providing all five beneficial miscellaneous uses:		

Appendix C: Riparian and Aquatic Invasive Plants

The following list includes riparian and aquatic invasive plant species of concern to be monitored within the wild and scenic river corridors.

Scientific name	Common name
Butomus umbellatus	flowering rush
Cyperus esculentus	yellow nutsedge
Egeria densa	Brazilian elodea
Glyceria maxima	reed sweetgrass
Hydrilla verticillata	hydrilla
Impatiens capensis	spotted jewelweed
Impatiens glandulifera	policeman's helmet
Impatiens parviflora	small-flowered jewelweed
Iris pseudacorus	yellowflag iris
Limnobium laevigatum	South American spongeplant
Ludwigia hexapetala	water primrose
Ludwigia peploides	floating primrose-willow
Lysimachia vulgaris	loosestrife, garden
Lythrum salicaria	loosestrife, purple
Lythrum virgatum	loosestrife, wand
Myriophyllum aquaticum	parrotfeather
Myriophyllum heterophyllum	variable-leaf milfoil
Myriophyllum spicatum	Eurasian watermilfoil
Myriophyllum spicatum x Myriophyllum sibiricum	Eurasian watermilfoil hybrid
Nymphaea odorata	fragrant waterlily
Nymphoides peltata	yellow floatingheart
Phalaris arundinacea	reed canarygrass
Phragmites australis	common reed (nonnative genotypes only)
Polygonum and Persicaria spp.	knotweed, all non-native
Potamogeton crispus	curlyleaf pondweed
Rubus armeniacus	Himalayan blackberry
Rubus laciniatus	cutleaf/evergreen blackberry
Sagittaria graminea	grass-leaved arrowhead
Schoenoplectus mucronatus	ricefield bulrush
Spartina alterniflora	cordgrass, smooth
Spartina anglica	cordgrass, common
Spartina densiflora	cordgrass, dense-flowered
Spartina patens	cordgrass, saltmeadow
Tamarix ramosissima	saltcedar
Typha species (non-native only)	nonnative cattail species and hybrids (does not include the native common cattail, Typha latifolia)
Zostera japonica	Japanese eelgrass