Quinault Indian Nation

Wetland Program Plan (2022–2027)

Addressing Four Core Elements:

- Monitoring and Assessment
- Voluntary Protection and Restoration
- Regulatory Activities
- Water Quality Standards for Wetlands

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The Quinault Indian Nation (QIN) would like to acknowledge the United States Environmental Protection Agency (EPA) for funding the development of this Wetland Program Plan (WPP). We are very appreciative of the support provided by Region 10 EPA staff in the continued development of a holistic QIN WPP for the Quinault Indian Reservation (QIR).

Quinault Indian Nation Wetland Program Plan Qualification

This WPP identifies activities necessary to protect, enhance, restore, and manage wetlands within the QIR. These activities are modeled after the Core Elements Framework (US EPA 2009) developed by the EPA. Certain activities identified within this WPP must occur sequentially, while others can occur concurrently or independently. Many of the actions and activities proposed in this WPP are not funded. Successful completion of these activities depends upon securing necessary financial support.

Quinault Mission

To always seek the Creator's wisdom and guidance to enhance the quality of life of our Nation's people through:

1) Preserving our roots: sovereignty, treaty rights and constitution, cultural* traditions, and natural resources;
2) Promoting our wings: employment and educational opportunities, prosperity, and physical, spiritual, and emotional well-being.

*"The totality of socially transmitted behavior patterns, arts, beliefs, institutions, and all other products of human work thought characteristic of a community or population." The American Heritage Dictionary, Second College Edition ©1982, 1985, 1991, by Houghton Mifflin Company

Quinault Vision

We are a Nation that draws strength from the values of our past and the resources within our community to manifest our shared future. We are a healthy, thriving, and sustainable community that inspires hope and self-reliance in our people. Our youth share the responsibilities of leadership and are prepared to take care of their future. We recognize the contribution of each citizen, honor authentic engagement and open communication, and have deep reverence for the Quinault Spirit that shines through our people, our ways, and our beautiful lands. We know who we are and exercise our sovereignty with wisdom, for the greater good of all. The Quinault homeland is the cradle of Quinault culture.

Quinault Division of Natural Resources Mission

To provide support, guidance, and oversight to all departments, programs, and projects relating to the natural resources of the Quinault Indian Reservation and the Usual and Accustomed Area (U&A) as well as tracking activities in the QIN Area of Interest.

Quinault Wetland Program Mission

To manage, preserve, enhance and maintain wetlands and their associated ecological and cultural functions on the Quinault Indian Reservation and, when possible, within the Quinault U&AA for the benefit of the Quinault Indian Nation now and for generations to come.

Figure 1.1 Sundew (*Drosera rotundifolia)* growing in a forested peat system wetland on the Quinault Indian Reservation, Washington, USA.

Background

The approximately 208,000-acre[1] QIR is located in the southwest corner of the Olympic Peninsula (Figure 1.2), approximately 35 miles north of the town of Hoquiam, Washington. The QIR is roughly triangular shaped. The base of the triangle stretches south to north from approximately the Moclips River to the Queets River along the coastline of the Pacific Ocean. The apex of this triangle is Lake Quinault. The western boundary of the Reservation is defined by low tide along the Pacific Coast, starting just north of Moclips, Washington and extending over 25 miles to the Reservation's northwest corner, located about two highway miles north of the Queets River Bridge. Much of the Reservation is in Grays Harbor County, but some northern portions are in Jefferson County. The QIR is largely surrounded by lands developed and managed for timber production or other natural resource extractions. Other surrounding areas include those considered natural undeveloped lands such as the foothills of the Olympic Mountains. Bounded to the east and north by the Olympic National Forest and the Olympic National Park, to the west of the QIR is the Pacific Ocean.

The Olympic Coast National Marine Sanctuary shelters the QIR coastline in its entirety. The length reaches north to Canada and south to California, and extends 25 to 30 miles seaward.

[1] http://www.quinaultindiannation.com/ An approximation which fluctuates with coastal accumulations, measured by the Mean Lower Low Water (MLLW). MLLW is simply the lowest of the two low tides per day (or the one low tide) averaged over a 19-year period.

Covering much of the continental shelf and major submarine canyons. The sanctuaries' intent is to regulate and protect important ecological resources, rich cultural and historical legacies.

Several large river systems discharge into the Pacific Ocean along the coastline; from north to south, these rivers include the Queets River, Whale Creek, Raft River, Quinault River, Wreck Creek and the Moclips River. Taholah Village, located south of the mouth of the Quinault River, is destined to be relocated due to threats of climate change and sea level rise. Upslope from the existing village is the Quinault Business Center and offices, the Generations Building the Roger Saux Health Center Building and several single-family residences. This is also the proposed location for the relocation of the Taholah Village, known as Upper Taholah Village. South of Taholah is Point Grenville (recently renamed Haynisisoos Point) and Grenville Bay, a sacred location for the Quinault, which extends into the Copalis National Wildlife Refuge. South of the Quinault Reservation are an assortment of small-unincorporated villages such as Moclips and Humptulips, and the larger port cities of Aberdeen and Hoquiam. Sitting at the western edge of Hoquiam is Bowerman Basin, Grays Harbor Waterfowl and Wildlife Refuge, a protected area near the mouth of the Chehalis River.

The QIN (U&A) Area consists of the usual and accustomed fishing areas confirmed by Judge Boldt in the original United States versus Washington State case, 384 F. Supp. 312 (1974). Fishing Areas include the "Clearwater, Queets, Salmon, Quinault (including Lake Quinault and the Upper Quinault tributaries), Raft, Moclips, and Copalis [Rivers] and Joe Creek." They also include "Grays Harbor, and all those streams which empty into [it]," the entire Chehalis River system including all of its tributaries as well as the salt waters "adjacent to their territory."

All of the QIR, with the exception of the northeastern portion, is low elevation and relatively flat. The northeastern portion gradually ascends to an elevation of 2,769 feet above sea level. Several major rivers cross the QIR including the Queets, Raft, and Quinault. The QIR lies within the temperate rainforest and receives approximately 90 inches of precipitation along the coast and up to 200 inches of precipitation in the northeast mountainous regions (USDA, accessed October 6, 2020).

The riparian areas on the QIR include some dense forests that are important locations for regulatory protection from timber harvest practices. Equally important are the "prairie wetlands" as they are fondly referred by the Quinault. In ecological terms, these prairie systems are known as bogs or fens due to their unique ecological conditions of peat soils, low nutrient and higher acidic content than other freshwater wetlands. The QIR is bountiful with different types of wetlands, resplendent gems that richly provide amphibian, fish, wildlife and culturally significant vegetation. For millennia, the fruits of the land for traditional food, medicines and textile materials for clothing, shelter, transportation, and artistic expression have sustained the Quinault people. Abundant rainfall nourishes the dense stands of coniferous-deciduous forests of the QIR, within which streams, wetlands, Lake Quinault, and other aquatic ecosystems occur, that sustain five species of salmon, including the famed Quinault "blueback" sockeye (*Oncorhynchus nerka*). The harvest of salmon has supported the very fabric of the Quinault culture and economy since time immemorial.

It has been with deep regret that for the past four years (2017 to 2020) the QIN has not opened the commercial fishing for its prized resource, the Quinault blueback, a sockeye salmon. This closure was in response to six consecutive years of unusually small salmon returns. However, for the 2021 season starting in May, a test fishery was implemented and the returns of blueback were much more robust than expected and the fishery continued as in its historical method with blueback finally available for membership. Linkages between the Quinault blueback and wetlands operate at multiple scales.

- Directly in terms of the Lacustrine wetlands that align the fringes of the lake;
- Riverine wetlands that provide important functions to the rivers and streams through which salmon migrate from the ocean to the lake; and the
- Wetlands on a larger landscape that function as the kidneys of the hydrologic system, protecting water quality and water quantity to the lake and rivers of the QIR.

Sockeye juveniles' rear extensively in lakes before they migrate out to sea and then adults return traveling up river to spawn on the lakeshore. This makes them more vulnerable to localized threats to Lake Quinault as well as other threats to the wetlands that provide important functions on the landscape.

There has been a general decline of natural salmon production during the twentieth century. Salmon depend upon peripheral habitats with connections to main stem rivers, and along the coastline and riverine wetland ecosystems. Chinook and Coho runs are in a state of severe decline with many runs listed as threatened under the Endangered Species Act (ESA), and chum salmon are also in a state of severe decline. All runs of salmon and other anadromous fish migrate to sea after smolting and rearing and return to these areas to spawn before death. Salmon benefit from wetlands on the landscape, including riverine wetlands along rivers, estuarine wetlands in the nursery areas of the coasts, and freshwater wetlands throughout the watersheds where they spawn.

The current subsistence and commercial fisheries on the Quinault and the Queets river systems are mostly supported by production of hatchery fish to augment lost populations of wild salmon. Most of the natural production declines on the QIR are due to land management (especially during the 1920s through the 1990s) that impacted rivers, streams and wetlands. Land use management is much better now, but the salmon resources that we are trying to recover are influenced by larger scale, more intense ecosystem challenges. A major factor for the past 50 to 70 years has been ecological changes as a result of climate change. Recent patterns of ecosystem impacts in the marine environment (marine heatwaves, acidification, community oscillations, etc.) are having major impacts on annual salmonid runs, as well as harmful effects on the Quinault River from climate change and decreasing riparian habitat structure and function. The Quinault River ecosystem has suffered tangible effects as a result of changes in hydrology as measured by the disappearance of the Anderson Glacier, as well as from increasing temperatures and acidification of the Pacific Ocean. In response to these changes, preservation and protection of the QIR's valuable aquatic resources, including riparian areas, and wetlands are critical for maintaining critically important fish runs and other culturally and economically important resources.

Salt marshes, a type of estuarine wetland ecosystem, provide an irreplaceable source of "blue" carbon known to pull carbon out of the atmosphere, and store it in their biomass and soil for long periods. Riparian and riverine wetlands associated with streams are also recognized to provide an important surface water and groundwater interaction, known as the hyporheic zone. The hyporheic zone is the region of sediment and porous space beneath and alongside a streambed where there is mixing of shallow and surface water vitally important for spawning fish, for juvenile salmonid prey organisms, and for improving water quality.

Additionally, wetlands provide critical habitat for wildlife, including Roosevelt elk (*Cervus canadensis roosevelti*), Olympic cougar (*Puma concolor*) and the American black bear (*Ursus americanus*), and numerous species of waterfowl. Wetlands provide diverse rearing and resting habitats for salmon smoltwhen they migrate and undergo natural chemical changes as they make their journeys out to the sea, and when they come back again. The unique characteristics and diversity of the Quinault wetlands produce traditionally significant plant species, culturally important to the Quinault such as beargrass (*Xerophyllum tenax*), sweet grass (*Schoenoplectus pungens*) used in basketmaking and camas lily (*Camassia quamash*), and important food plant, just to name a few of the many culturally important plants of wetlands (Figure 1.3).

Wetlands within the boundary of the QIR are distributed across the landscape; their shape, size, alignment, and classification type reflect historic glacial movement and runoff processes as well as the QIR's coastal location. Wetlands occurring on the QIR fall within each of the primary Cowardin classification types including marine, estuarine, riverine, lacustrine, and palustrine (Cowardin et al, 1979). The updated wetland plant species list illustrates the botanical diversity of the QIR wetlands and the scope of the cultural significance of wetlands that host them (see Appendix A).

Figure 1.3 Bottom left clockwise: Quinault elder and museum archivist Lani Chubby harvesting sweetgrass (*Schoenoplectus pungens)* for basket weaving in the traditional way; top left a close-up of sweetgrass; top right camas lily (*Camassia quamash*) in bloom in the early spring; and bottom right beargrass (*Xerophyllum ten*ax) in bloom in the autumn. (Photo credits: bottom left taken by Janice Martin, the remaining photos are Creative Commons Images.)

The QIN Wetland Program development began in 2013 with WPDG funding provided by the Environmental Protection Agency (EPA), which funded the development and adoption of the first Wetland Program Plan that was approved in January 2016. Subsequent WPDGs received every two years since have provided program funding. Significant highlights from the EPA funding received include the following:

- The hiring of a Wetland Specialist for each 2-year grant period;
- The development and approval of the first Wetland Program Plan (2016-2021);
- Adoption of QIN Wetland Rapid Assessment protocol that includes a cultural plant species checklist;
- Development of the Draft December 2016 QIN Wetland Monitoring and Assessment Strategy;
- Publication of the "Ethnobotany in the Land of the Quinault" authored by Douglas Deur and the Knowledge-holders of the Quinault Indian nation and highlights culturally important plants of the Quinault and their uses. For limited distribution;
- The QIN Wetland Climate Change Vulnerability Assessment, which quantifies wetland impacts and suggests future research needs, concerns and opportunities;
- Creation of a modeled wetland map layer in 2017 (annotated as Contractor 1 in Figure 4.1);
- Wetland data collection and field verification from four field seasons, which continues;
- A continuous Wetland Training Program for QIN staff;
- Adoption of the U.S. Army Corps of Engineers (USACE) wetland definition into the QIN Forest Management Plan, Tribal Code Title 61 (Natural Resource Management), and Tribal Code Title 48 (Land Use and Development Code;
- An updated digital QIN wetland map inventory layer, meeting federal geospatial data standards and criteria (annotated as NWI_2020, in Figure 1.4).

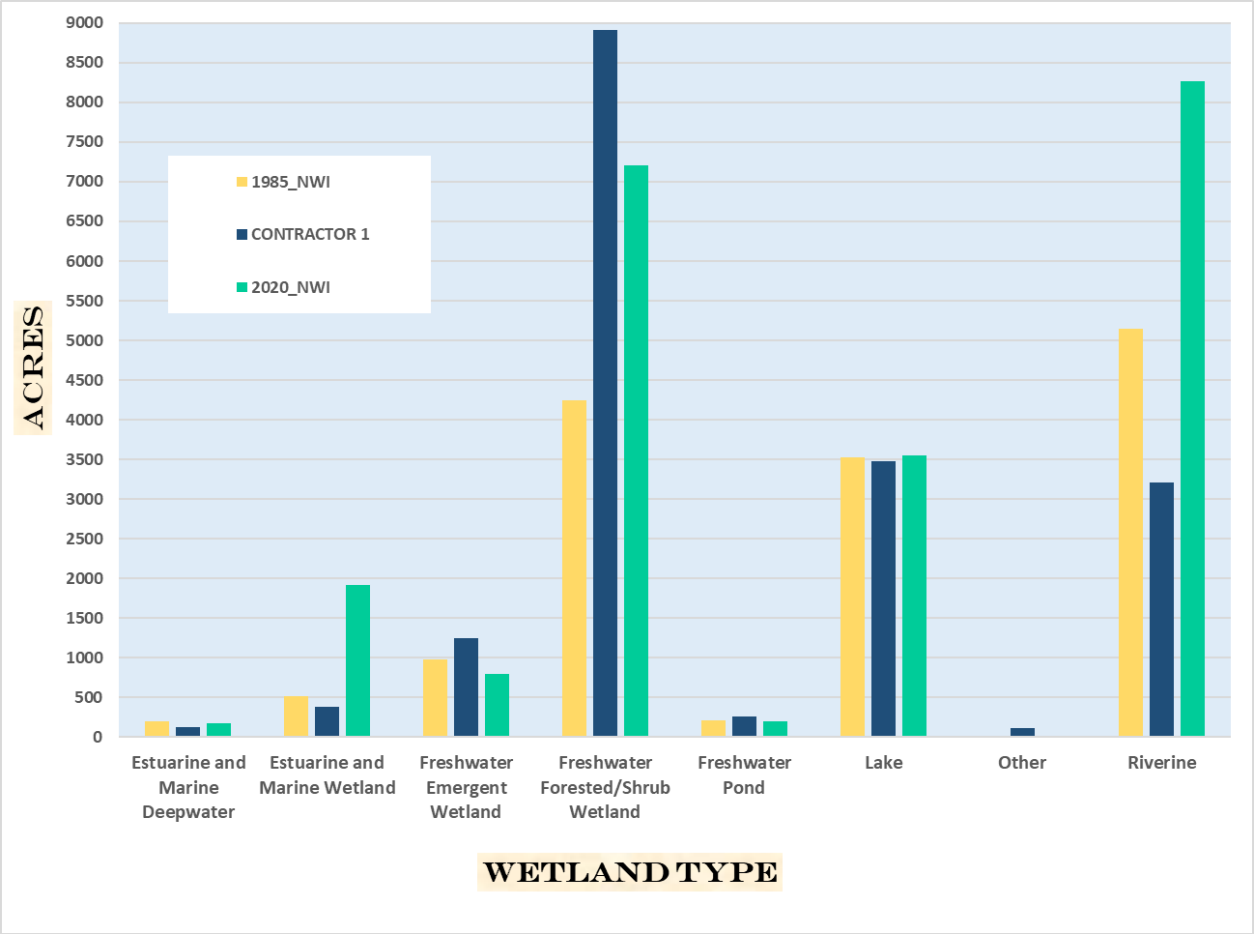
The primary methodology to create the QIN 2020 wetland map layer update used interpretation of ancillary datasets such as soil surveys, remote sensing,light detection and ranging (LiDAR) and some field reconnaissance and ground-truthing. The updated QIN wetland map layer was included in the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI). The USFWS provides information to the public on the status and trends of the United States of America's wetlands and delivers an easy to use map like view of America's wetland resources.

Specific standards of accuracy and quality control are mandatory for wetland mapping updates to be accepted by the USFWS NWI. Technical specifications for wetland mapping are provided by the Federal Geographic Data Committee (FGDC) Document Number FGDC-STD-0-15-2009 (FGDC, 2009). Standards facilitate development, sharing, and the use of geospatial data and services for implementing the National Spatial Data Infrastructure (NSDA).

The QIN is now able to assess and compare wetland mapping conducted on the QIR. The older NWI mapping (annotated as NWI, 1985 in Figure 1.4) used photo interpretation of aerial imagery from 1985 (Bill Kirschner, USFWS, Personal Communication 2016) and the updated NWI_2020 map data used recent infrared aerial imagery, Light Detection and Ranging (LiDAR) derived topography, digital soils and remote sensing data (SWCA, 2019) (see Figure 1.4 Comparison of Wetland Mapping Inventories).

What is interesting to note from Figure 1.4 are the significant differences in acreage of Wetland Types between these different times and accuracy of inventory methods used. For example, Estuarine/Marine wetlands between NWI_1985 were mapped at 515 acres as compared to the updated accepted NWI_2020 which mapped 1,912 acres. This is attributed to the level of

accuracy involved in the remote sensing tools and data and the follow-up field verification of those areas over four seasons of data collection. In addition, the difference between mapped extent of Riverine wetlands between the NWI_1985 inventory which mapped 5,145 acres as compared to the updated accepted NWI_2020 inventory which mapped 8,261 acres, is substantial. These changes are due to increased level of accuracy and precision of the QIN updated data layers, including improved mapped stream layer that has been field verified and updated over the years by both the QIN GIS Department and Environmental Protection staff.



Historic Management [2]

The Quinault people began interacting with European explorers around 1775. The "Stevens Treaty" signed in 1856 established 10,000 acres for a reservation that centered on the small fishing village of Taholah. In 1873, the QIR was expanded to 190,000 acres "to provide more land for the friendly bands of fish eating Indians" (Morishimo, 2021). When the QIR boundaries

[2] The following discussion is not intended to be all inclusive of the facts and events, but is provided as a summary of some key events relevant to QIR land tenure and management history.

were established, several thousand acres of land intended to be included were erroneously excluded by a surveying error in 1897 and were later designated as part of the Olympic National Park by President Franklin Roosevelt in 1938.

The communal lands of the QIR were broken up into 80-acre allotments beginning in the early 20th century pursuant to the assimilation policies pursued with passage of the General Allotment Act of 1887. The Act intended to encourage agrarian life styles among native people. Between the years of 1904 and 1933, 2,340 individual allotments were issued to tribal members. These allotments were placed in trust with title held by the United States on behalf of the allottee beneficiaries, extinguishing virtually all of the land on the QIR.

In 1917, the demand for timber during World War I spurred the Bureau of Indian Affairs (BIA) to begin clear-cutting forests within the QIR. Intentionally set fires that covered thousands of acres of cut over land followed. Logging cleared the land for agriculture so there were no provisions for reforestation of allotments and the cut over lands were covered by logging slash and brush fields. The BIA consolidated allotments in the southeast corner of the QIR into a 2,000 acre tribally owned Quinault Experimental Forest where the first tree planting restoration effort of its kind was conducted in Washington State.

During periods of vacillating Federal Indian Policy, management of QIR forests were a matter of repeated controversy involving clearcutting, selective harvest, stumpage prices, lack of reforestation, associated environmental damage, including impacts to fisheries resources from poor land-use management, and further fragmentation of allotment ownership as original allottees passed away and property was divided and distributed to heirs. Congressional hearings into Quinault timber sales were convened during the 1950's. During the 1950's and 1960's, much of the land with remaining forests was sold to logging companies as the United States pursued a Termination Policy to try to get out of the Indian business. QIN leadership was outraged, closing QIR beaches to the public, closing the Chow Chow Bridge across the Quinault River to prevent access for logging, and filed a law suit against the BIA and the United States for mismanagement and breach of fiduciary tribal trust responsibilities. In 1975, the Indian Self Determination and Education Assistance Act passed, drastically changing the relationship between the QIN and the BIA. Under this authority, the Quinault Indian Nation gradually assumed greater control for management of the natural resources on the QIR. QIN adopted forest management practices into its code of laws and regulations as a sovereign government and initiated an aggressive land consolidation program. Self Determination marked the reassertion of tribal sovereignty, which had been suppressed by policies of federal paternalism. The current QIN constitutions and bylaws were adopted in 1975.

Through allotment, QIR lands were distributed to individuals and families from many different tribes. Over time, ownership of the allotments became increasingly fragmented and complex involving undivided property interests held in fee and trust as the result of marriage and heirship processes. This fractionation has significantly increased the difficulty and cost of land management activities and reduced the ability of the QIN and individual landowners to benefit from QIR lands and resources. Any development, road-building, timber harvest, restoration or other activity requires agreement from the majority of affected owners of trust land.

The QIN pursued land consolidation as its highest priority beginning in the 1960s, working with logging companies to reacquire lands that had been alienated during the termination era. These efforts were greatly expanded with passage of the Quinault North Boundary Restoration Act in 1988 (PL 100-638) which returned 12,000 acres of the Olympic National Forest to QIN ownership and provided for revenues generated from timber production to be used for land consolidation and forest management.

Currently, the QIN continues to work to reacquire and consolidate their ownership by purchasing trust and fee lands as they become available. These efforts will allow the QIN to manage the land more holistically as a landscape under environmental practices, provide a permanent homeland for the Quinault people, improve the ability of allottees to benefit from their land holdings, and reduce administration costs.

Efforts of the QIN to consolidate lands and implement environmentally sound management practices provide the means by which QIR natural resources, such as wetlands, may be identified to preserve, restore, and/or enhance. One example of a QIN repurchase of a natural area is the restored wetland shown below in Figure 1.5.

Figure 1.5 A restored wetland pond within the Quinault Indian Reservation, Washington, USA.

Future Management

This Wetland Program Plan (WPP) update has been funded under an EPA Wetland Program Development Grant (FY20-22). The tasks identified in this WPP are consistent with the previous 2016-2021 WPP's goals and objectives to identify, document and monitor wetlands

across the QIR; to identify priorities for wetlands protection and restoration; and to manage the QIR's wetland resources through updated regulatory programs (see Figure 1.6).

Figure 1.6 wetland regulatory review process in action with the Quinault Division of Natural Resources Interdisciplinary Team (QDNR IDT) on a post-harvest project review to discuss best management practices as a holistic management approach to the working forests and wetlands protection within the Quinault Indian Reservation, Washington, USA.

Wetland field data collection and map inventory verification continues to help document and identify wetlands as well as culturally important wetland plant communities on the QIR. Wetland monitoring data collected is added to the expanding QIN Wetland Database and Tracking System. A consistent wetland assessment methodology that has been field tested in previous years will be expanded and shared with all appropriate QIN departments (i.e., Planning, Forestry, Fisheries, Cultural Resources, Wildlife, and Water Quality). Some of the collected data will include wetland boundary identification, Cowardin classification, hydrogeomorphic (HGM) classification (Brinson, 1993), vegetation classification (including cultural species identification), buffer determination and condition assessment, hydrological regime and hydrologic connectivity, landscape context, natural stressors, site condition, water quality, function and value assessment, as well as evaluation and documentation of both potential and actual proposed land-use project impacts. From these data collected, recommendations will be made for future regulatory wetland categories, levels of protection and restoration needs.

The Wetland Tracking System Database will progress and be maintained under this updated WPP. This WPP includes working with the United States Army Corps of Engineers on projects affecting wetlands outside of the Reservation within the QIN's U & A. Additionally, this WPP intends to introduce, approve and integrate a cooperative wetlands protection and permitting process. The methodology outlined in the EPA approved Quality Assurance Project Plan (QAPP, July 2018), and the expanded updated QAPP 2020 to be approved prior to field season 2022 will provide the structural framework for a long-term wetland monitoring and assessment program.

The updated QAPP, which includes adding use of the Washington Natural Heritage Program Environmental Integrity Assessment (WNHP-EIA) to our monitoring protocols, has been submitted to the EPA for review and approval. Due to Washington COVID-19 pandemic health

restrictions, we were unable to obtain training on the WNHP-EIA methodology and are examining other assessment methods for future use. There are an assortment of functional assessment methods available. As time allows these will be reviewed and tested for appropriate use by the QIN.

All of these components will facilitate a more knowledgeable and holistic approach to identify wetlands for conservation and restoration activities. Information will be stored in a QIN Wetland Tracking Database.

The development and adoption of this updated WPP strives to ensure conservation and restoration of significant wetlands on the QIR, to develop tools to monitor and assess wetland conditions and functions, and to develop regulations to protect wetlands and associated aquatic resources important to QIN.

Figure 1.7 An estuarine wetland on the Raft River within the Quinault Indian Reservation, Washington, USA.

Collaborative Efforts

This document will facilitate a collaborative process between various Divisions and Departments of the QIN. As such, endeavors to preserve and enhance wetland structure, function and cultural significance may be synergistic with the development and/or update of the following management documents:

- QIN Land Consolidation Plan
- Lower Quinault Tributaries Assessment, Evaluation and Restoration Assessment
- Climate Change Vulnerability Assessment

- Climate Change Adaptation Plan
- Forest Management Plan
- Forest Practices Regulations
- Miscellaneous Watershed Restoration Plans
- Final Taholah Village Relocation Master Plan

Within the Division of Natural Resources, the 2022-2027 WPP will facilitate collaboration amongst the Forestry, Fisheries, and Environmental Protection and potentially other departments in all wetland-related projects.

Wetland Program Plan Organization

The organization of the WPP presents the Administrative Activities pertinent to all of EPA's Core Elements. Followed by those program activities related to each individual Core Element: 1) Monitoring and Assessment, 2) Voluntary Protection and Restoration, 3) Regulatory Activities including 401 Certification, and 4) Water Quality Standards for wetlands. Each Core Element contains goals, objectives, activities and a projected timeline to provide the best available estimate of priority needs for the QIN over the next six-year planning period. It is important to understand that while some of the following activities have been divided into the four Core Elements they actually depend and relate to each other. The activities identified below are meant to be used as guidance and are subject to revision and/or redirection depending upon QIN priorities, funding availability, and staffing constraints.

Core Elements Administrative Activities

Administrative Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Investigate alternative funding sources for QIN Wetland Program.	X	X	X	X	X	X	Grant Writer, Environmental Protection Manager, Wetland Specialist, Invasive Species Program Coordinator	Active
Prioritize funding for a permanent Wetland Specialist Position, in order to create a sustaining wetland program for the QIN. (Currently, the Wetland Specialist position is funded by competitive EPA grants).	X	X	X				Environmental Protection Manager, Invasive Species Program Coordinator	Active
Research, update and document QIN WPP to achieve long-term environmental goals.		X		X		X	Wetland Specialist, Invasive Species Program Coordinator	Active
Compile data and report to EPA on progress toward accomplishing tasks identified in this WPP (and Wetland Program Develop Grants when funded).	X	X	X	X	X	X	Wetland Specialist	Active
Conduct quarterly meetings of Wetland Working Group in order to collaborate and implement watershed planning.	X	X	X	X	X	X	Wetland Working Group	Active

Core Elements Administrative Activities

Administrative Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Continue participation with the Pacific Northwest Tribal Wetlands Working Group (PNWTWIG)	X	X	X	X	X	X	Wetland Specialist, Invasive Species Program Coordinator	Active
Use existing wetland geodatabase, update as needed and share with other departments.	X	X	X	X	X	X	Wetland Specialist, Wetland Working Group and Data Analyst	Active

Core Element: Monitoring and Assessment

Thus far, the management of QIR wetlands has improved from an unstructured, underdeveloped review program into a more strategical monitoring process occurring as a deliberate and sustaining component of proposed timber harvest layouts and land use planning project reviews. The tasks identified under this core element will facilitate a strategic approach to wetland management across the landscape with specific emphasis to the cultural and environmental importance of wetlands. This type of approach will represent a more holistic approach to management, as directed by the Quinault Council, and will hopefully reconnect tribal members to wetlands that have played a significant role in their history. Tasks included in this core element rely heavily upon the QDNR Wetland Working Group (previously the Wetland Core Team). Formed in 2013 the Wetland Working Group assisted in the development of the first QIN Wetland Program Plan (2016-2021). Consisting of staff from the Environmental Protection Department: Wetland Specialist (temporary position 2016 through March 2023); Fish Habitat Biologist II; Water Quality Program Coordinator; Invasive Species Program Coordinator; Cultural Resource Specialist; Special Projects Forester, and Water Quality Technician. Other participants as their schedules allow include QDNR Division Director, Environmental Protection Manager, and other Forestry, Fisheries and Planning Departmental staff.

The updated QIR GIS wetland map layer displays over 18,500 acres of wetlands, some of which remain in a natural unaltered state and others altered as a direct result of historic management practices. For example, road reconstruction projects as related to timber harvest projects and or culvert installations. In December 2016, the Draft QIN Wetland Monitoring and Assessment Strategy (M&A) introduced the following long-term goals:

1. Maintaining healthy streams and riparian habitat for both fish and people.
2. Continue efforts to achieve goals within the QIN Wetland Program Plan (2016-2021).
3. Assess water quality and quantity functions of wetlands (surface/groundwater/estuarine and freshwater).
4. Improve current wetland identification and delineation methods to align with federal standards.
5. Continue to use the Level II Rapid Assessment Method for categorizing wetlands based on ecological functions and other values to QIN.
6. Create a more streamlined flow of wetland related information within and between various QIN Departments and offices as well as with outside agencies.
7. Educate staff on wetland related science and issues.

These goals remain pertinent to manage the QIR wetlands as a holistic component of the landscape. The updated QIR GIS wetland map layer is part of the QIN's Level 1 Monitoring and Assessment approach and is part of the QIN's M&A Strategy. Having this map layer helps identify where wetlands occur, provides general information about wetland size, type and potential functions [e.g., by Cowardin classification and Hydrogeomorphic type (Brinson, 1973)]. By knowing where, what size, how many, and what type within each watershed at the landscape scale, the QIN has a good idea of the diversity and functions the wetlands provide within the QIR. This information can be used for land-use planning. However, it is also important to have methods to collect site specific scale data and information about wetlands. The QIN has been using a Level 2 Rapid Assessment Protocol it adopted in 2016 to help identify wetland functions and values. However, this approach is general and may not adequately characterize wetland ecological conditions or provide the level of survey required to identify characteristics of wetlands that may be of cultural significance or value. Prior to the mandated social distancing restrictions caused by the recent COVID-19 pandemic, as part of the 2019-2021 EPA WPDG, the Wetland Specialist and Invasive Species Program Coordinator were to obtain training in the Washington Natural Heritage Program's Ecological Integrity Assessment (WNHP-EIA) to incorporate these methods as a component of the QIN M&A Strategy. The purpose of using the WNHP-EIA was to classify and prioritize QIR wetlands for land purchase, and conservation. However, due to the social distancing mandates, training in the use and application of the WNHP-EIA did not occur. The Wetland Specialist and Invasive Species Program Coordinator conducted a pilot study using the WNHP-EIA to their best understanding.

In the interim, the Wetland Specialist is investigating other M&A methodologies, including designing a unique monitoring program specifically to fit the needs of the QIN using aspects of the WNHP EIA, such as the Floristic Quality Assessment (FQA) protocol found in the EIA. The FQA is a standardized assessment method that calculates a numerical index reflecting the quality of native

plant communities for a given area. It indicates the impacts of invasive species and can also be used to monitor the effectiveness of land-management and restoration practices. The Wetland Ecosystem Services Protocol for the United States (WESPUS)[1], is also being considered, this methodology provides a science-based and landscape-level view of a wetlands' various ecological and cultural values. Wetland M&A methods and approaches will continue to be evaluated to decide upon the most effective, affordable and relevant methodology for the QIN. The Wetland Program continues with intradepartmental interviews that will aid in the process of determining the most compatible M&A methods and approaches to adopt.

A Quinault Community Survey is currently underway focused on interests related to a QIN Prairie Wetland Management Plan, described and discussed in the Voluntary Protection and Restoration Activities Section. Results from the community survey, in addition to a forthcoming investigation into appropriate data uses for departmental leads, will assist in defining the next steps to expand and improve our current Level II Rapid M&A methods and hopefully determine a course of action towards a more intensive quantitative Level III M&A Strategy.

Goals:

- To guide and coordinate monitoring and assessment efforts of the QIN in order to holistically manage and conserve wetlands on the QIR.

Objectives:

- Develop a wetland monitoring and assessment program for the QIN to monitor the status and trends of wetlands within the QIR consistent with the application of *Elements of a State Water Monitoring and Assessment Program for Wetlands* (EPA 2006) by using EPA's three-tiered approach[2].
- To provide decision makers with the best possible information on the extent, type, health and cultural values of the QIN's wetlands and the ecological and cultural values that they provide. Equally important is the identification of sources of stress to the health of the QIR wetlands.
- Insure methods and approaches incorporate assessing Cultural values of wetlands.
- Including surveying wetlands to find evidence of overwintering habitat for salmonids, and those with potential to provide salmonid habitat.

[1] Dr. Paul Adamus (2011). Manual for the Wetlands Ecosystems Protocol for the United States. Beta Version 1.0; or more recent 1.3 (2016) Wetland Ecosystems Protocol. There may be newer versions such as that which the Nez Perce Tribe regionalized and has adopted.
[2] https://www.epa.gov/wetlands/wetlands-monitoring-and-assessment

Core Element: Monitoring and Assessment

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Determine mutually beneficial M&A goals through interdepartmental meetings and other communication methods	X	X					Wetland Specialist	Active
Identify program decisions and long-term environmental outcome(s) that will benefit from a wetlands monitoring and assessment program.		X	X	X			Wetland Specialist, Wetland Working Group	Active
Identify and Define Monitoring Program Objectives.	X						Wetland Specialist, Wetland Working Group	Active
Review and update the QIN Wetland Program M&A Strategy as appropriate.	X		X		X		Wetland Specialist, Wetland Working Group	Active
Continue to conduct Level II Rapid Assessment within proposed timber harvest sales and planning projects.	X	X	X	X	X	X	Wetland Specialist	Active
Examine other sources for monitoring assessment methodologies and information available that fit program goals and objectives (WNHP-EIA, WESPUS, FQA, QIN prototype).	X						Wetland Specialist, Invasive Species Program Coordinator, Wetland Working Group	Active

Core Element: Monitoring and Assessment

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Review /Refine /Update secondarily a core set of indicators or functions to represent wetland condition. Including water quality, hydrology and culturally significant wetland attributes.	X		X		X		Wetland Specialist, Invasive Species Program Coordinator, Wetland Working Group	Active
Review and update a Quality Assurance Project Plan to include restoration and protection assessment methodology (WNHP-EIA, WESPUS, FQA, QIN prototype).		X		X		X	Wetland Specialist	Active
Continue to collect wetland data, improve data management and sharing processes.	X	X	X	X	X	X	Wetland Specialist, Invasive Species Program Coordinator, Wetland Working Group	Active

Core Element: Voluntary Protection and Restoration

The fragmented ownership patterns across the QIR significantly affect tasks under this core element. Thus, activities to provide protection and/or restoration to wetlands are conducted on lands under the direct ownership of the QIN and/or with funds provided by the National Resources Conservation Service. Individually owned lands held in trust by the BIA are managed primarily for economic return and the agency asserts that to hold individual landowners responsible for additional resource protection or restoration activities would negatively affect the financial return. Any activity on these lands require majority agreement amongst the landowners. Given that allotments can have hundreds of owners, acquiring enough agreement to move forward can be a daunting bureaucratic process. The largest wetland restoration project to date was in 2016 and on the QIN owned allotments within Moses Prairie. The project, designed as a controlled burn to mimic historic indigenous or traditional ecological management practices, generated a lot of tribal interest and participation. There is evidence to support that projects like the Moses Prairie Burn Project are indispensable for the maintenance of historical cultural practices within the QIN prairie wetlands and for survivorship of the culturally significant plants and specifically the common camas lily. Restoration work within the wetland prairies is much easier to defend to tribal leaders, elders, staff and members mainly due to the known presence of these keystone culturally significant and traditionally used plants. Equally important to their unique vegetation communities, wetland prairies provide habitat for wildlife. Promoting the benefits of further restoration work in other wetland types other than the wetland prairies, could be the next course of action. Lack of enthusiasm and support from tribal leaders, elders, members, staff and individual landowners necessitates further monitoring and documentation of data to provide evidence of successful restoration objectives. Tasks under this core element will increase tribal member interest in and knowledge of wetland restoration and protection options while also working to help prioritize the protection and/or restoration of QIN owned wetlands.

Goals:

- Identify ecologically and culturally important wetlands while working to maintain, improve, and increase their extent, function and protection through acquisition and management.

Objectives:

- Prioritize wetland areas for QIN land acquisition.
- Clearly and consistently define restoration and protection goals across QIN land management practices.
- Work with tribal leaders, elders and across QIN departments to identify priorities for wetland restoration and protection.
- Protect priority intact wetlands from degradation or destruction; restore priority wetland areas, condition, and functions; monitor and track progress over time; and modify practices as appropriate.

- Enhance native vegetation, species diversity, and structural complexity on QIR wetlands and riparian corridors with an emphasis on increasing culturally significant plants and plants that provide significant fish and wildlife benefits.
- Develop a Wetland Management Plan for Moses Prairie, intended to be the framework or template for future wetland management plans and expand to other prairie wetland systems. These Wetland Management Plans will identify protection and restoration actions and activities for each culturally important named wetland prairie area.

Core Element: Voluntary Protection and Restoration

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Identify wetlands for protection, acquisition and management.	X	X	X	X	X	X	Wetland Specialist, Wetlands Working Group	Active
Apply for and partner with Ecology on the National Coastal Wetlands Conservation Grant to obtain funding for land acquisition.	X		X		X		Wetland Specialist, Wetlands Working Group	Planned
Target specific wetland visitation inviting tribal leaders, elders, the QIN Business Committee once/ year at the minimum. In order to build relationships within the Quinault Tribe.	X	X	X	X	X	X	Wetland Specialist, Invasive Species Program Coordinator, Cultural Resources Specialist	Planned
Identify specific sites as priorities and establish site specific restoration goals based on input from tribal community, elders, QIN departmental input and other available information.	X	X	X	X	X	X	Wetlands Working Group, Wetland Specialist, Invasive Species Program Coordinator	Planned

Core Element: Voluntary Protection and Restoration

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Compose, adopt and initiate the Moses Prairie Wetland Management Plan for use as a template for other wetland prairie systems, comprised of long-term protection/ maintenance of wetland functional values.	X	X	X				Wetland Specialist, Invasive Species Program Coordinator and Wetland Working Group	Planned
Develop Wetland Management Plans for Chow Chow, Baker, Moclips, and O'Took Prairies formulated on the template provided by the Moses Prairie Wetland Management Plan.		X	X	X			Wetland Specialist, Invasive Species Program Coordinator and Wetland Working Group	Planned
Gain approval and implement the outstanding Wetland Management Plans for prairie wetlands.	X	X	X	X			Wetland Specialist, Invasive Species Program Coordinator and Wetland Working Group	Active
Research and initiate potential partnerships outside the Quinault Tribe in order to gain support and funding for restoration activities.	X		X		X		Wetlands Working Group	Active
Create Incentive Programs to promote aquatic resource protection.				X	X	X	Wetland Working Group	Planned

Core Element: Regulatory Activities including 401 Certification

Updates to QIN tribal codes either have occurred in the last six-years of the Wetland Program Plan or are currently under modification and review. The 2017 QIR Forest Management Plan will be up for revision in another ten years in 2027. Title 61 (QIN Natural Resource Management Code) was revised subsequently and the Forest Practice Regulations are currently under revision. QIN received treatment in a similar manner as a state for water quality standards under CWA Section 303(c) in 2018 and upon receipt of that authority received CWA Section 401 water quality certification authority. Under CWA Section 401 the QIN has the authority to ensure that any federally permitted or licensed activities meet tribal water quality requirements. This includes meeting any and all tribal codes, ordinances or environmental laws that are water quality related for any/all waters, including wetlands. QIN has developed draft Water Quality Standards (WQS), which include narrative standards that address wetlands. Once QIN's WQS are approved they may also be cited in QIN CWA 401 water quality certifications to protect waters, water quality and wetlands as well.

The tasks included under this core element rely heavily upon staff to collaborate in their efforts of improving the administrative tasks associated with various regulatory programs, permit issuance and compliance tracking. Comprehensive regulation of wetlands will only be feasible if the Quinault Business Committee elects to develop policy that will guide various levels of protection for wetlands within the QIR. Once policy is developed and the proper permitting structure is in place, additional steps towards achieving comprehensive wetland regulation will be possible.

These events occur slowly and significant patience and tact are required to orchestrate wetland protection mechanisms. The difficult venture of QIN land ownership, previously described, dictates prioritization of wetland areas for QIN land acquisition to better protect and manage QIR wetlands.

Goals:

- Clearly Define the Jurisdictional Scope of the Program.
- Facilitate QIN staff, member and Business Committee support toward advanced wetland protection regulations.

Objectives:

- Develop standardized wetland water quality parameters conducive designated beneficial uses, and narrative criteria.
- Analyze current regulatory mechanisms and permitting procedures in order to strengthen enforcement efforts.
- Develop permitting programs to avoid, minimize and/or compensate for impacts to wetlands and other aquatic resources.

- Apply 401 water quality certification authority to ensure that federally permitted or licensed projects meet QIN water quality requirements (including tribal codes, ordinances, environmental laws, and water quality standards upon approval)

Core Element: Regulatory Activities including 401 Certification

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Explore applicable options to enable electronic web-based permitting for tracking permits and regulatory review activities.	X	X	X	X	X	X	Wetland Working Group	Active
Continue to develop and maintain clear guidelines for roles, responsibilities, and procedures for review of permits for activities that require approval.	X		X		X	X	Wetland Working Group	Active
Develop clear guidance for staff involved with permitting to achieve maximum protection on wetlands of importance as identified by the QIN.			X	X	X	X	Wetland Specialist, Invasive Species Program Coordinator	Active

Core Element: Regulatory Activities including 401 Certification

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Continue to identify opportunities to streamline permit processes to ensure adequate avoidance, minimization and compensatory mitigation measures are addressed.	X		X		X	X	Wetland Working Group	Active
Provide clear and comprehensive jurisdictional coverage of aquatic resources.				X	X	X	Environmental Protection Manager, Invasive Species Program Coordinator, Wetland Specialist	Planned
Develop and implement general permits for activities that are similar in nature or recurring and have predictable outcomes and effects.		X	X	X	X	X	Fish Habitat Biologist	Active

Core Element: Regulatory Activities including 401 Certification

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Create and improve auditing procedure for current Hydraulic Project Approval Process by applying Level II and Rapid Assessment methods and Report to Quinault Business Committee.	X	X					Wetland Specialist, Invasive Species Program Coordinator, Fish Habitat Section leader, Fish Habitat Biologist	Active
Continue staff training and integration of wetland classification and assessment as a component of the ID Team process.	X	X	X	X	X	X	Environmental Protection Manager, Wetland Working Group	Active
Develop GIS related tools to assist in enforcement investigations and contested case proceedings.	X		X			X	GIS Department and Wetland Specialist	Active
Develop enforcement and compliance mechanisms to deter violations and incorporate lessons learned from ongoing HPA audit.			X	X	X	X	Resource Protection Department, Environmental Protection Department	Active

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Review existing regulatory requirements for buffers to determine if they are adequate to protect water quality, flood control and other functions of wetlands.		X	X	X			Wetland Specialist	Planned
Draft or make recommendations for revised buffer requirements which provide adequate water quality protection, flood control and other functions of wetlands.			X	X	X		Wetland Specialist	Planned

Core Element: Water Quality Standards for Wetlands

Water quality standards (WQS) provide the scientific foundation for regulatory protection of water quality under the Clean Water Act (CWA). WQS not only set water quality goals for a tribe's water bodies, but also serve as the regulatory basis for establishing water quality-based treatment controls and strategies. In 2018, EPA authorized the QIN to be treated in a similar manner as a state (TAS) under CWA Section 518 for water quality standards under CWA Section 303(c) and also received CWA Section 401 water quality certification authority. What this means is that QIN has the authority to implement and manage programs under the CWA to protect waters of the United States and to develop WQS for waters under the QIN's authority. Wetland WQS will help to provide the guidelines for protecting wetlands via the QIN's WQS anti-degradation policy, designated beneficial uses, and narrative criteria. Applications of WQS including Wetland WQS will help to integrate other programs that affect wetlands such as the CWA Section 106 nonpoint source pollution control program and the CWA Section 319 restoration program. The tasks included under this core element rely upon staff to collaborate in their efforts of effectively establishing wetland WQS that protect and sustain wetland functions and values within the QIR. Establishing wetland water quality standards requires comprehensive monitoring of the wetlands resources in order to gather sufficient baseline data, and to determine if wetland WQS are being met. Once policy is developed and the proper permitting structure is put in place, additional steps towards achieving comprehensive wetland regulation, as part of overall implementation of QIN's surface water management and water quality standards program, will be possible.

Goals:

- Establish permit requirements and/or develop and implement CWA 401 certification program that affectively protects aquatic resources including wetlands.

Objectives:

- Determine wetland prioritization for standardized water quality monitoring within QIN wetlands.
- Review existing (other agencies, tribes) wetland water quality monitoring methods and protocols and decide upon which to adopt as part of QIN wetland water quality monitoring program.
- Develop QIN wetland-specific water quality standards.
- Obtain approval from QIN Business Committee for wetland-specific water quality standards.
- Adopt and incorporate wetland-specific water quality standards into organization decision-making.
- Implement wetland water quality monitoring program on an ongoing basis.

Core Element: Water Quality Standards for Wetlands

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Examine other sources for prioritizing and monitoring information within QIN and other tribes or local government agencies.	X	X					Wetland Specialist, Water Quality Program Coordinator, Wetland Working Group	Active
Gather and Analyze monitoring data and other information that will become the basis of water quality standards	X						Wetland Specialist, Water Quality Program Coordinator, Wetland Working Group	
Identify wetland WQ monitoring objectives.	X						Water Quality Program Coordinator, Wetland Specialist, Invasive Species Program Coordinator	Planned
Coordinate with QIN Water Quality Monitoring Program to identify shared goals and activities and refine as needed.	X	X	X				Wetland Specialist, Water Quality Program Coordinator, Wetland Working Group	Planned

Core Element: Water Quality Standards for Wetlands

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Define designated uses for different wetland types (e.g. fish and wildlife habitat).	X		X				Wetland Specialist, Water Quality Program Coordinator	Active
Develop anti-degradation policy for wetlands, including determining, with approval of the BC, which wetlands will be established as Outstanding Resource waters and Tier 1-3 wetlands.	X	X	X	X	X	X	Invasive Species Program Coordinator, Wetland Specialist, Water Quality Program Coordinator, Group	Active
Locate where designated uses apply within QIR			X				Wetland Specialist, Water Quality Program Coordinator, Wetland Working Group	Planned
Prioritize wetland types for water quality monitoring to collect qualitative and/ or quantitative baseline field data.		X	X				Wetland Specialist, Wetlands Working Group	Planned
Examine how to integrate wetlands monitoring strategy into existing water quality monitoring efforts as feasible			X	X			Wetland Specialist, Water Quality Program Coordinator, Wetlands Working Group	Planned

Core Element: Water Quality Standards for Wetlands

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Define develop and document wetlands WQ monitoring strategy			X	X			Wetland Specialist, Wetland Working Group	
Specify QIN wetland WQ baseline field data.	X	X					Wetland Specialist, Wetlands Working Group	Planned
Gather wetland monitoring data and other information and analyze data results to provide quantitative data as the basis to develop-wetland numeric water quality standards			X	X	X		Wetland Specialist, Water Quality Program Coordinator, Wetland Working Group	Planned
Develop a plan to establish and adopt wetland WQ numeric criteria				X	X	X	Wetland Specialist, Water Quality Program Coordinator, Wetland Working Group	Planned

Core Element: Water Quality Standards for Wetlands

Program Development Activities	2022	2023	2024	2025	2026	2027	Responsible Party	Status
Use water quality standards as basis for regulatory decisions (including use and application in CWA 401 certifications of federal permits/licenses, water quality protection through HPA conditions, and other tribal permits).				X	X	X	Invasive Species Program Coordinator, Wetland Specialist, Water Quality Program Coordinator, Wetland Working Group	Planned
Determine plan to measure metrics for restoration or compensatory mitigation prioritization					X	X	Invasive Species Program Coordinator, Wetland Specialist, Water Quality Program Coordinator, Wetland Working Group	Planned

QIN Wetland Program Evaluation

Achievement for a successful QIN Wetland Program includes open communication and respectful interaction with the other Quinault Division of Natural Resource Sections. Administrative Activities and Program Development Activities as outlined in this WPP, includes observation, assessment and input from the following Departments in the Division of Natural Resources: Environmental Protection, Forestry, and Fisheries. Their valuable assessment and interface with the Wetland Program continues through the next six years and ought to include the following considerations:

- Has funding been adequate to support the accomplishment of program goals and objectives?
    - What additional sources of funding should be pursued?
- Do the goals and objectives within this WPP, fit into the WPDG milestone schedules?
- Do they need revision?
- What is the state of QIR wetlands?
    - Are the conditions or quantity of wetlands changing?
- Are activities on the QIR contributing to a decline or increase in wetland condition?
- Has any specific wetland restoration occurred? If so, what, where, and how much total acreage?
    - Was it effective?
- Have any wetlands been acquired for protection? If so, where and how much total acreage?
- Are wetland regulatory protections effective?
    - If so, what has been effective?
    - If not, why not and what could be done differently?

A comprehensive evaluation and review of the Wetland Program Plan should occur every 2 years in order to stay on track with achieving goals and objectives. A comprehensive review of this Wetland Program Plan was conducted between fall 2020 and winter 2021 in order to facilitate application for renewal.

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Appendix A. Quinault Indian Reservation Preliminary Plant Observation List

Family	Species	Common Name	n/i	Y/N
TREES				
Sapindaceae	*Acer macrophyllum*	big leaf maple	n	Y
Betulaceae	*Alnus rubra*	red alder	n	Y
Pinaceae	*Picea sitchensis*	Sitka spruce	n	Y
Pinaceae	*Pinus contorta* var. *contorta*	shore pine	n	Y
Pinaceae	*Pinus contorta* var. *latifolia*	lodge pole pine	n	Y
Pinaceae	*Pinus monticola*	western white pine	n	Y
Salicaceae	*Populus trichocarpa*	black cottonwood	n	Y
Pinaceae	*Pseudotsuga menziesii* var. *menziesii*	Douglas-fir	n	Y
Cupressaceae	*Thuja plicata*	western red cedar	n	Y
Pinaceae	*Tsuga heterophylla*	western hemlock	n	Y
SHRUBS				
Sapindaceae	*Acer circinatum*	vine maple	n	Y
Cornaceae	*Cornus sericea*	red-osier dogwood	n	N
Fabaceae	*Cytisus scoparius*	Scot's broom	i	N
Rhamnaceae	*Frangula purshiana*	cascara	n	Y
Ericaceae	*Gaultheria shallon*	salal	n	Y
Ericaceae	*Kalmia microphylla* var. *occidentalis*	bog laurel	n	N
Caprifoliaceae	*Lonicera involucrata* var. *involucrata*	black twinberry	n	N
Rosaceae	*Malus fusca*	western crabapple	n	Y
Ericaceae	*Menziesia ferruginea*	fool's-huckleberry	n	N
Myricaceae	*Myrica californica*	Pacific bayberry	n	N
Myricaceae	*Myrica gale*	sweet gale	n	N
Rosaceae	*Physocarpus capitatus*	Pacific ninebark	n	N
Ericaceae	*Rhododendron groenlandicum*	bog Labrador tea	n	Y
Rosaceae	*Rosa nutkana* var. *nutkana*	Nootka rose	n	Y
Rosaceae	*Rubus bifrons*	Himalayan blackberry	i	N
Rosaceae	*Rubus laciniatus*	evergreen blackberry	i	N
Rosaceae	*Rubus leucodermis*	blackcap raspberry	n	Y
Rosaceae	*Rubus parviflorus*	thimbleberry	n	Y
Rosaceae	*Rubus spectabilis*	salmonberry	n	Y
Rosaceae	*Rubus ursinus*	dewberry	n	Y
Salicaceae	*Salix hookeriana*	Hooker willow	n	Y
Salicaceae	*Salix lasiandra* var. *lasiandra*	Pacific willow	n	Y
Salicaceae	*Salix sitchensis*	Sitka willow	n	Y
Caprifoliaceae	*Sambucus racemosa* var. *racemosa*	red elderberry	n	Y
Rosaceae	*Spiraea douglasii* var. *douglasii*	Douglas' spiraea	n	Y
Caprifoliaceae	*Symphoricarpos albus*	common snowberry	n	N

Ericaceae	*Vaccinium ovatum*	evergreen huckleberry	n	Y
Ericaceae	*Vaccinium oxycoccos*	bog cranberry	n	Y
Ericaceae	*Vaccinium parvifolium*	red huckleberry	n	Y
Ericaceae	*Vaccinium uliginosum*	bog blueberry	n	Y
HERBS				
Asteraceae	*Achillea millefolium*	yarrow	n	Y
Asteraceae	*Ambrosia chamissonis*	silver beachweed	n	N
Asteraceae	*Anaphalis margaritacea*	pearly everlasting	n	N
Ranunculaceae	*Anemone oregana*	Oregon anemone	n	N
Apiaceae	*Angelica lucida*	sea-watch	n	N
Asteraceae	*Artemisia suksdorfii*	coastal mugwort	n	Y
Rosaceae	*Aruncus dioicus* var. *acuminatus*	Sylvan goatsbeard	n	N
Brassicaceae	*Barbarea orthoceras*	American wintercress	n	N
Asteraceae	*Bellis perennis*	English daisy	i	N
Orobanchaceae	*Boschniakia hookeri*	Vancouver groundcone	n	N
Saxifragaceae	*Boykinia intermedia*	boykinia	n	N
Plantaginaceae	*Callitriche heterophylla*	different-leaved water-starwort	n	N
Plantaginaceae	*Callitriche stagnalis*	pond water-starwort	i	N
Asparagaceae	*Camassia quamash var.*	camas	n	Y
Brassicaceae	*Cardamine angulata*	seaside bittercress	n	N
Brassicaceae	*Cardamine hirsuta*	hairy bittercress	i	N
Caryophyllaceae	*Cerastium glomeratum*	sticky mouse-ear chickweed	i	N
Onagraceae	*Chamerion angustifolium* ssp. *circumvagum*	fireweed	n	N
Asteraceae	*Cirsium* sp.	thistle		N
Montiaceae	*Claytonia sibirica*	Siberian miner's lettuce	n	N
Rosaceae	*Comarum palustre*	marsh cinquefoil	n	N
Convolvulaceae	*Convolvulus soldanella*	beach morning-glory	n	N
Cornaceae	*Cornus unalaschkensis*	western bunchberry	n	N
Papaveraceae	*Corydalis scouleri*	Scouler's corydalis	n	N
Papaveraceae	*Dicentra formosa* ssp. f*ormosa*	Pacific bleeding heart	n	N
Plantaginaceae	*Digitalis purpurea*	foxglove	i	N
Droseraceae	*Drosera rotundifolia*	round-leaf sundew	n	N
Hydrocharitaceae	*Elodea canadensis*	common waterweed	n	N
Onagraceae	*Epilobium ciliatum*	willowherb	n	N
Asteraceae	*Erigeron peregrinus* var. *thompsonii*	Thompson's wandering daisy	n	N
Menyanthaceae	*Fauria crista-galli*	deer cabbage	n	N
Rosaceae	*Fragaria chiloensis*	coastal strawberry	n	Y
Rubiaceae	*Galium trifidum* var. *pacificum*	small bedstraw	n	N
Asteraceae	*Gamochaeta ustulata*	purple cudweed	n	N
Gentianaceae	*Gentiana sceptrum*	staff gentian	n	N

Rosaceae	*Geum macrophyllum*	largeleaved avens	n	N
Apiaceae	*Heracleum maximum*	common cow parsnip	n	Y
Caryophyllaceae	*Honckenya peploides* ssp. *major*	sea purslane	n	N
Boraginaceae	*Hydrophyllum tenuipes*	Pacific waterleaf	n	N
Hypericaceae	*Hypericum anagalloides*	bog St. John's-wort	n	N
Asteraceae	*Hypochaeris radicata*	hairy cat's-ear	i	N
Balsminaceae	*Impatiens* sp.	jewelweed	i	N
Fabaceae	*Lathyrus japonicus* var. *maritimus*	beach pea	n	N
Asteraceae	*Leucanthemum vulgare*	ox-eye daisy	i	N
Apiaceae	*Ligusticum apiifolium*	celery-leaf wild lovage	n	N
Liliaceae	*Lilium columbianum*	Columbian lily	n	N
Fabaceae	*Lotus corniculatus*	bird's-foot trefoil	i	N
Onagraceae	*Ludwigia palustris*	marsh primrose-willow	n	N
Lamiaceae	*Lycopus* sp.	water-horehound	n	N
Araceae	*Lysichiton americanus*	skunk cabbage	n	Y
Asparagaceae	*Maianthemum dilatatum*	false lily-of-the-valley	n	N
Brassicaceae	*Nasturtium officinale*	watercress	i	N
Nymphaeaceae	*Nuphar polysepala*	spatterdock	n	N
Apiaceae	*Oenanthe sarmentosa*	American water-parsley	n	N
Oxalidaceae	*Oxalis oregana*	Oregon wood-sorrel	n	N
Asteraceae	*Petasites frigidus* var. *palmatus*	western coltsfoot	n	N
Plantaginaceae	*Plantago lanceolata*	English plantain	i	N
Plantaginaceae	*Plantago macrocarpa*	Alaska plantain	n	N
Plantaginaceae	*Plantago major*	common plantain	i	N
Orchidaceae	*Platanthera dilatata*	white bog orchid	n	N
Polygonaceae	*Polygonum* sp.	knotweecd	i	N
Potamogetonaceae	*Potamogeton natans*	floating-leaved pondweed	n	N
Rosaceae	*Potentilla anserina* ssp. *pacifica*	Pacific silverweed	n	N
Lamiaceae	*Prunella vulgaris*	self-heal	n	N
Ranunculaceae	*Ranunculus repens*	creeping buttercup	i	N
Boraginaceae	*Romanzoffia tracyi*	Tracy's mistmaiden	n	N
Polygonaceae	*Rumex acetosella*	sheep sorrel	i	N
Polygonaceae	*Rumex obtusifolius*	bitter dock	i	N
Rosaceae	*Sanguisorba officinalis*	great burnet	n	N
Asteraceae	*Senecio jacobaea*	tansy ragwort	i	N
Asteraceae	*Senecio sylvaticus*	woodland groundsel	i	N
Asteraceae	*Senecio vulgaris*	common groundsel	i	N
Asteraceae	*Sonchus asper*	prickly sow thistle	i	N
Lamiaceae	*Stachys mexicana*	Mexican hedge-nettle	n	N
Caryophyllaceae	*Stellaria calycantha*	northern bog starwort	n	N
Caryophyllaceae	*Stellaria crispa*	crisped starwort	n	N

Caryophyllaceae	*Stellaria media*	common chickweed	i	N
Asteraceae	*Taraxacum officinale*	common dandelion	i	N
Saxifragaceae	*Tolmiea menziesii*	piggyback plant	n	N
Myrsinaceae	*Trientalis europaea*	Arctic starflower	n	N
Fabaceae	*Trifolium pratense*	red clover	i	N
Fabaceae	*Trifolium repens*	white clover	i	N
Fabaceae	*Trifolium wormskioldii*	salt marsh clover	n	N
Typhaceae	*Typha latifolia*	common cattail	n	Y
Melanthiaceae	*Veratrum* sp.	wild hellebore	n	N
Plantaginaceae	*Veronica americana*	American brooklime	n	N
Plantaginaceae	*Veronica officinalis*	common speedwell	i	N
Fabaceae	*Vicia nigricans* ssp. *gigantea*	giant vetch	n	N
Violaceae	*Viola glabella*	stream violet	n	N
Melanthiaceae	*Xerophyllum tenax*	beargrass	n	Y
GRASS, SEDGES, and RUSHES				
Poaceae	*Agrostis* sp.	bentgrass		N
Poaceae	*Aira caryophyllea* var. *caryophyllea*	silver hairgrass	i	N
Poaceae	*Ammophila arenaria* ssp. *arenaria*	European beachgrass	i	N
Poaceae	*Anthoxanthum odoratum*	sweet vernalgrass	i	N
Cyperaceae	*Bolboschoenus maritimus* ssp. *paludosus*	saltmarsh bulrush	n	Y
Poaceae	*Bromus* sp.	brome		N
Poaceae	*Calamagrostis* sp.	bluejoint	n	N
Cyperaceae	*Carex aquatilis* var. *dives*	Sitka sedge	n	N
Cyperaceae	*Carex echinata ssp. phyllomanica*	coastal star sedge	n	N
Cyperaceae	*Carex exsiccata*	big inflated sedge	n	N
Cyperaceae	*Carex livida*	pale sedge	n	N
Cyperaceae	*Carex macrocephala*	bighead sedge	n	N
Cyperaceae	*Carex obnupta*	slough sedge	n	N
Cyperaceae	*Carex utriculata*	inflated sedge	n	N
Poaceae	*Deschampsia cespitosa* ssp. *cespitosa*	tufted hairgrass	n	N
Poaceae	*Elymus glaucus*	blue wildrye	n	N
Cyperaceae	*Eriophorum chamissonis*	russet cottongrass	n	NN
Poaceae	*Holcus lanatus*	velvetgrass	i	N
Juncaceae	*Juncus bufonius* var. *bufonius*	toad rush	n	N
Juncaceae	*Juncus bulbosus*	spreading rush	i	N
Juncaceae	*Juncus canadensis*	Canadian rush	i	N
Juncaceae	*Juncus ensifolius*	daggerleaf rush	n	N
Juncaceae	*Juncus laccatus*	shiny rush	n	N
Juncaceae	*Juncus* spp.	rushes		N
Poaceae	*Leymus mollis* var. *mollis*	American dunegrass	n	N

Juncaceae	*Luzula parviflora*	small-flowered woodrush	n	N
Juncaceae	*Luzula* sp.	woodrush		N
Poaceae	*Phalaris arundinacea*	reed canarygrass	i	N
Poaceae	*Poagrostis aequivalvis*	Arctic bent	n	N
Cyperaceae	*Rhyncospora alba*	white beakrush	n	N
Cyperaceae	*Scirpus microcarpus*	small-fruited bulrush	n	N
Cyperaceae	*Schoenoplectus pungens*	sweetgrass	n	Y
Cyperaceae	*Trichophorum cespitosum*	tufted clubrush	n	N
Poaceae	*Trisetum cernuum*	nodding trisetum	n	N
FERNS and ALLIES				
Pteridaeceae	*Adiantum pedatum*	Common maidenhair fern	n	Y
Dryopteridaceae	*Athyrium filix-femina* var. *cyclosorum*	common ladyfern	n	Y
Blechnaceae	*Blechnum spicant*	deer fern	n	Y
Dryopteridaceae	*Dryopteris expansa*	northern wood fern	n	Y
Equisetaceae	*Equisetum arvense*	common horsetail	n	Y
Lycopodiaceae	*Lycopodium clavatum*	common clubmoss	n	
Polypodiaceae	*Polypodium glycyrrhiza*	licorice fern	n	Y
Polypodiaceae	*Polypodium scouleri*	coast polypody	n	N
Dryopteridaceae	*Polystichum munitum*	western sword fern	n	Y
Dennstaedtiaceae	*Pteridium aquilinum* var. *pubescens*	bracken fern	n	Y
Selaginellaceae	*Selaginella* sp.	selaginella	n	N

n/i = native or introduced
Y/N = cultural significance/ unknown