TULALIP RESERVATION
COASTAL MANAGEMENT PROGRAM

DRAFT

for: Puget Sound Association of
Cooperating Tribes

by: The LaTourelle Associates

DRAFT

TULALIP RESERVATION COASTAL MANAGEMENT PROGRAM

Prepared for:

Puget Sound Association of Cooperating Tribes

Prepared by:

THE LA TOURELLE ASSOCIATES

Planning & Environmental Design

808 Terminal Sales Building
Seattle, WA 98101 - 682-8087

The preparation of this report was financially aided through a grant from the Washington State Department of Ecology with funds obtained from the National Oceanic and Atmospheric Administration, and appropriated for Section 306 of the Coastal Zone Management Act of 1972.

F O R W A R D

This plan addresses the requirements of the Coastal Zone Management Act of 1972 (PL 92-583)[1]. The document is divided in two parts: First is a description of the Reservation and the coastal resources; and second is the management program. The Reservation description is a summary of the physical and cultural characteristics of the Reservation with special emphasis on the marine and wetland environments.

The second part of the Coastal Area Plan focuses on the goals, policies and objectives of the Tribes in its management of coastal area resources. Part Two also sets out a detailed method of evaluating coastal area programs and proposals for development and describes the means of tribal control over thos activities.

Over the past decade, an enormous amount of material has been written about the Tulalip Reservation and the coastal area environment. We have tried to distill from that material the most current and pertinent. The list of references we have included will provide more detailed information when it is required.

Since the Tribes already has an approved zoning ordinance, we have recommended an amendment to Ordinance 35 that incorporates the Coastal Area Management Plan as a guiding policy statement. This amendment also establishes a special review and approval procedure for all Coastal Management Area proposals. No new administrative structure or permit process was necessary to implement the Coastal Area Management Plan.

Finally, as in almost every other aspect of tribal government operations, the extent of the Tribes jurisdiction over the Reservation coastal area resources is unclear. This is a large number of agencies which have some degree of influence over the use and development of the Reservation coastal resources. Without the cooperation of all those agencies, the benefits of those resources will be lost by stalemate or default.

[1]The requirements for management grants are set forth in the Federal Register Vol. 40, No. 6 1-9-75.

P A R T O N E

RESERVATION DESCRIPTION
AND
INVENTORY

PART ONE - DESCRIPTION OF THE RESERVATION*

I. LOCATION

The Tulalip Reservation is located in Snohomish County, Washington, five miles north of the City of Everett, on the north side of Port Gardner Bay. The eastern boundary measures six and one-half miles along Interstate-5 and the Reservation shares an interchange with the City of Marysville, which is directly east across the freeway at the southern boundary. The northern boundary measures eight miles along Fire Trail Road. The south and west boundaries front for about 12 miles on the salt water of Puget Sound and for about two miles on Ebey Slough, a slow moving channel of the Snohomish River mouth.

The Reservation, of 22,000 acres, lies within the Snohomish Drainage Basin. Three sub-basins run in a north-south direction through the area. The interior and principal sub-basin is the Tulalip Basin, with the Warm Beach Basin along the coast to the west and the Quilceda Creek Basin to the east.

The source of stream waters within the Reservation can be traced primarily to the hills of the three ridge-lide land forms, with surface runoff being the major supplier. Tulalip Creek is fed in part by Lake Goodwin and Lake Shoecraft, north of the Reservation.

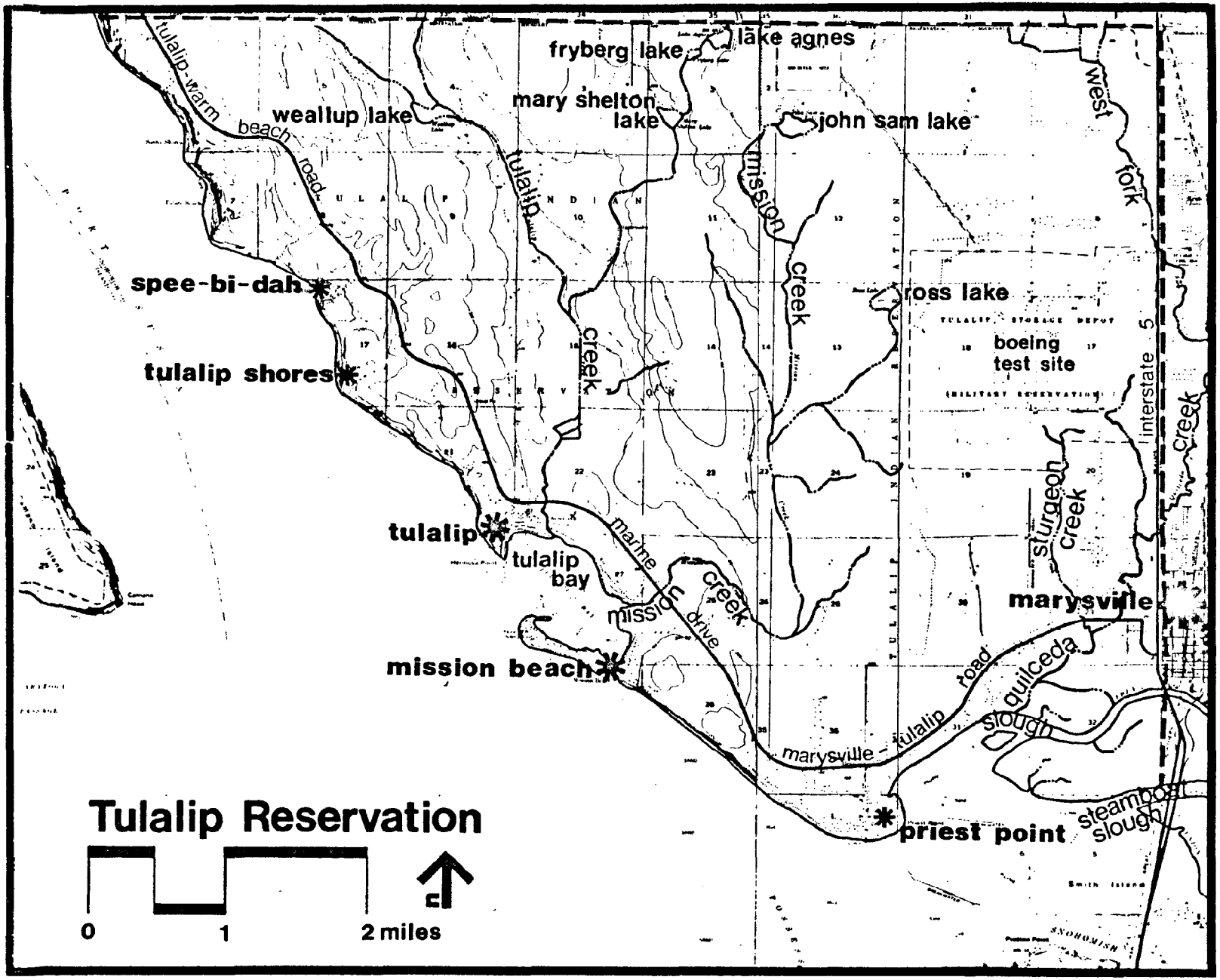
II. PHYSICAL FEATURES

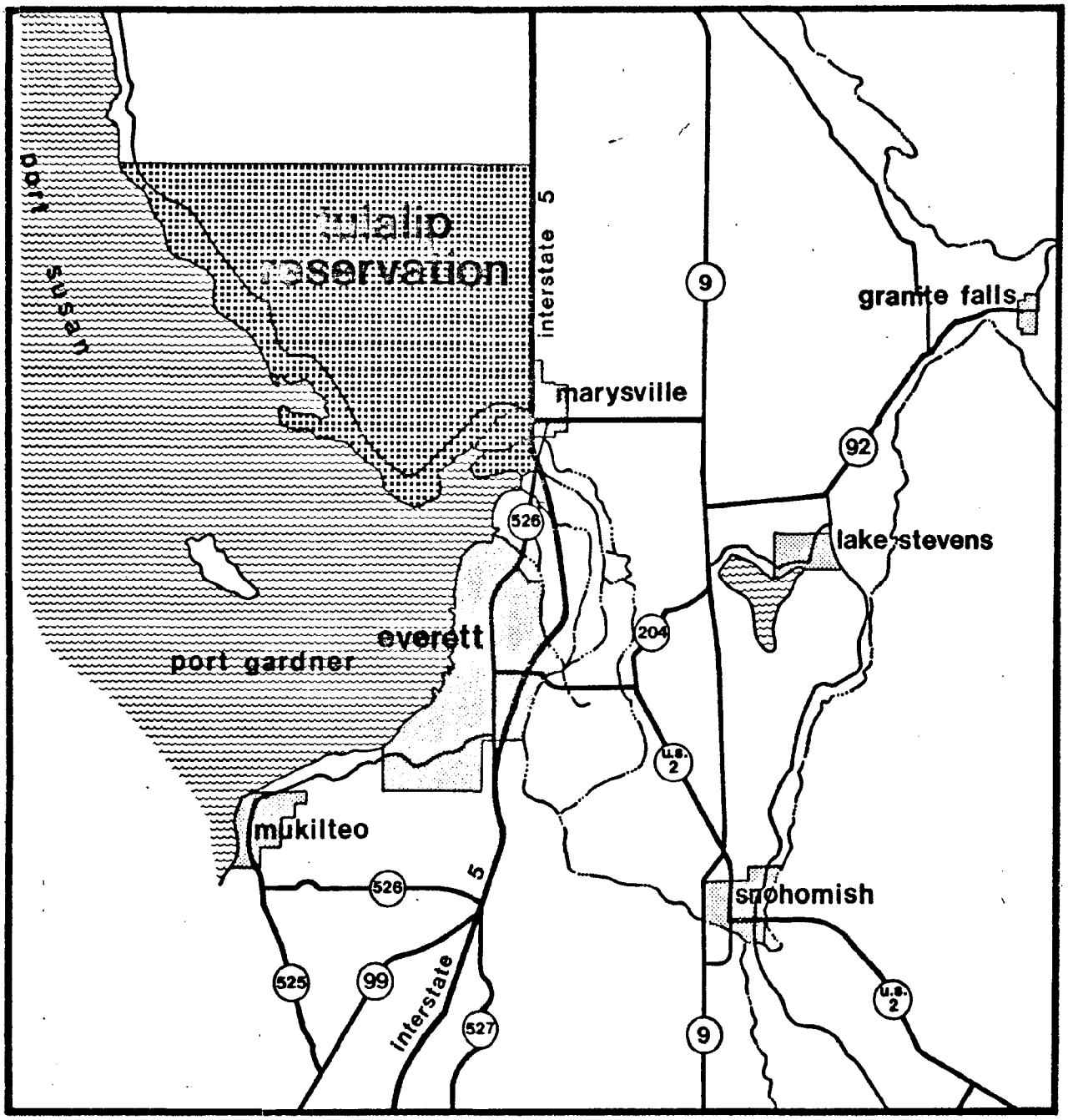
A. Topography

The land is characterized by gently rolling to hilly terrain with steep slopes. The land rises from sea level to elevations approaching 600 feet along the tops of three dominant ridges which define the Reservation drainage basins.

Between the ridges, small valley floors of poorly drained and organic soils follow the drainage system of Tulalip

*For a complete and detailed description of the Reservation, see the Catwell Associates, Comprehensive Plan-Tulalip Reservation 1972.


tulalip warm beach road
fryberg lake
lake agnes
mary shelton lake
weallup lake
john sam lake
west fork
mission creek
tulalip creek
spee-bi-dah
ross lake
boeing test site
tulalip shores
interstate 5
creek
tulalip
tulalip bay
marine drive
sturgeon creek
marysville
mission beach
quilceda slough
road
marysville - tulalip
steamboat slough
priest point
Tulalip Reservation
0
1
2 miles



vicinity map

Tulalip Reservation

0 1 2 5 miles

and Mission Creeks south to Tulalip Bay, an oval body of water partially enclosed by a hook of land called Mission Beach. The bay is shallow throughout the southeastern half, with mud exposed at low tides.

Along the eastern boundary of the Reservation, a continuous strip of land, one and one-quarter mile wide, lies within the Marysville Trough. This low-land, never exceeding an eight percent slope or rising above 100 feet in elevation, is the valley floor for Sturgeon and Quilceda Creeks. Steep slopes rise to the west. The soil is primarily poorly drained with the exception of some well drained material along Quilceda Creek.

To the south is the narrow strip of shoreland along Ebey and Union Sloughs. These waters form part of the tidal estuary of the Snohomish River, emptying into Port Gardner Bay.

Lying between Ebey and Union Sloughs is an area called Big Flats. Once a tideflat, the area has been filled with industrial wastes for development as an industrial area.

B. Reservation Geology - Structure and Hazards

The geology of the Reservation is primarily characterized by glacial till, commonly known as hardpan. The till areas form the majority of the uplands and rolling terrain.

The wetland area along the Tulalip Creek and Mission Creek watersheds are underlain by permeable sand and gravel sediments to a depth of about 50 feet. These sand and gravel areas aid in surface-groundwater exchange.

Much of the shoreline area is dominated by sea cliffs or steep hills. The cliffs are sometimes outcroppings of exposed rock, but more often are simply steep hills with discontinuous layers of mixed sand and gravel interspersed with or underlain by layers of clay and silt.

The beaches along the shore are sand is some areas. Tulalip Bay forms the only inlet-type beach formation.

C. Soils

The soils of the Reservation can be characterized by five general groups: Well-drained; imperfectly drained; poorly drained mineral; organic and miscellaneous lands. The Reservation is largely overlain by well drained soils of the Alderwood series. Pockets of organic soils, peat and muck type sediments, are found in the wetlands. A more complete description of Reservation soils is found in the Tulalip Environmental Study.[1]

The wetland areas of Quilceda, Mission and Tulalip Creeks and those adjoining Weallup Lake may be classified as sensitive areas with respect to non-soil related environmental factors. The peat and muck in these areas are only a few feet thick. They form a highly permeable, unstable basis for any type of development.

D. Landslides and Erosion

No major landslides have occurred on the Reservation. However, much of the shoreline on the western boundary is steep bank terrain, of over 25% slope, with bluffs reaching up over 200 feet from the beach.

Slides are usually associated with steep slopes, such as those found along the valley sides and sea cliffs on the Reservation. In addition, groundwater contributes to landslide hazard. Under some conditions, groundwater perched above impermeable sub-strata may act as a lubricant, easing the movement of overlying materials. This situation is particularly common where the impermeable sub-strata is a layer of clay.

The silty clays, such as the Bellingham series, can be fluid when saturated with rainfall. The sandy loams are susceptible to erosion when groundcover is removed.

[1]Triad Associates Tulalip Environmental Study 1977

The rough broken land of steep hillsides and sea cliffs, along the extreme northern shores of the Reservation, is underlain with Admiralty Clay and could be susceptible to slides. Large areas of the Bellingham clay loams are found on the steep side slopes above the Mission Creek drainage basin. Sandy loams of the Everett, Edmonds and Custer series are also found along the sea cliffs and on interior hillsides above drainage ways.

E. Floods, Erosion, Accretion

1. Floods. The Snohomish Valley floodplain was determined by the Corps of Engineers in 1975 and is the extent of flooding expected with a 100 year flood. The Reservation was not included in the study and the ten foot contour from the tip of Priest Point east to the area around the mouth of Quilceda Creek was identified as the floodplain boundary.

   The floodplain, as designated by the Corps of Engineers, is divided into the floodway and the floodway fringe, and is the configuration selected by Snohomish County, Everett and Marysville for planning purposes. The Snohomish County Ordinance 18.68 prohibits permanent structures, landfills and excavations within the floodway and requires that permanent structures within the fringe be floodproofed. It also prohibits most landfills within the fringe.

   Any flooding of the Snohomish River has a potential impact on the tribal economy, in that damage can be done to the fisheries. Flooding destroys the habitat for spawning and nursing the salmon fry. After a particularly damaging flood, the only way to re-establish a run is through artificial propagation.

2. Erosion. Erosion of reservation soils into major drainage ways is a major concern for the protection of the fisheries. This is difficult to control on much of the Reservation where large parcels of land

are being subdivided into smaller five acre tracts. The attendant grading and clearing often clogs natural drainage ways and dislodges natural vegetative cover which holds the soils in place. Silting of streams destroys the quality of the water used for the fish rearing program and destroys the natural spawning areas for the natural runs.

Logging activities, which have occurred on the steep sideslopes on the Reservation, have perpetrated conditions of erosion which jeopardize the creeks and streambeds, essential to fish and wildlife habitat on the reservation.

Due to the hilly nature of reservation lands, certain regions are subject to erosion. Many of the recently timbered sections in the northern north-central portion are particularly susceptible. The entire shoreline, except in extremely rocky regions, is subject to tidal and wave erosion. The steep ridge adjacent to the Marysville trough is forested, but would be subject to heavy erosion if cleared.

3. Accretion. Tulalip Bay is the site of natural beach accretion. Tides and currents deposit sand continuously into the bay off the end of the spit at Mission Beach. The south end of the bay is exposed mud flats at low tide. Any permanent structure or activity, such as a marina, would require that a channel be dredged regularly.

F. Hydrology

The hydrology of the Reservation consists mainly of direct freshwater precipitation. Some surface and groundwater flows onto the Reservation across the northern boundary. Three small streams cross into the Reservation from the north. Two are branches of the Quilceda Creek, which enter the Reservation, then flow out to the east and back in again as the main section of the Creek. The third

is a branch of Tulalip Creek, north of Lake Weallup. The most significant land runoff or underground flows occur in the vicinity of the unnamed wetland at the northwest branch of Tulalip Creek and in the Lake Agnes area. In most other areas, surface flow is directed into creeks or away from the Reservation.

G. Surface Water

The Reservation is usually classified as apart of the Snohomish River Basin, however, the surface waters are all independent drainages leading directly to Possession Sound or Tulalip Bay. The three major streams on the Reservation are the Quilceda, Mission and Tulalip Creeks. Mission and Tulalip Creeks are completely freshwater streams with associated freshwater marshes and swamps in several places. They flow from the northern regions, southerly to the lowland marshes between them and both empty into Tulalip Bay.

Mission Creek, until recently, flowed directly into Tulalip Bay through a deep ravine and was little influences by tidal action. During 1979 a dam was constructed at the mouth to form a fish rearing reservoir.

Tulalip Creek is impounded in a large reservoir built for power generation during the late 1800's. The outfall is regulated by gates at the dam. During 1975 a second dam was constructed at tide level below the outfall to create a second fish rearing pond.

Quilceda Creek meanders along the easterly edge of the Reservation emptying into Ebey Slough through a long, wide, tidal marsh. Only the Quilceda and its tributary, Sturgeon Creek, are tidal for any portion. The lower reaches of Quilceda Creek, below the Tulalip Road Bridge, are navigable to small craft.

The Reservation has a number of small lakes. With the exception of Ross Lake, which is wholly owned by the

Tribes, there is road access to all the named lakes, which are: Mary Shelton, Agnes, Fryberg, John Sam and Weallup. There are many small unnamed lakes throughout the Reservation. There is a possibility of developing some of them into larger more productive lakes. Where development has occurred around the lakes, it has been of low intensity, such as summer homes and mobile homes.

H. Ground Water

Groundwater now provides the major portion of the Reservation drinking supply. The main aquifers are the Deep Coastal Aquifer, running from Hermosa Point, north to the Reservation boundary; the Central Plateau Aquifer in the north central lake area; three intermixed aquifers at various depths near Priest Point; the Eastern Ridge Aquifer on the north-south ridge above Marysville Plain; and the Eastern Sand-Northeast Artesion Aquifer on the Marysville Plain. Due to lack of wells or test drillings on the central portion of the Reservation, the extent of mixing or overlapping of these systems in unknown.[1]

I. Water Quality

Many of the aquifer systems on the Reservation have problems with high iron concentrations and hardness, particularly the three eastern aquifers. At present, about 70 percent of the water used on the Reservation comes from the eight known aquifers, and 90 percent of this water is used for residential requirements. Any development which threatens contamination of important groundwater supplies and sources must be carefully examined.

Water quality is also important in controlling the health and viability of all water-related natural systems. Pollutants in the form of high nutrient concentrations, detergents or toxic substances detri-

[1]See the U.S. Geological Survey, Open File Report 76-493, Water Resources of the Tulalip Reservation, Washington by B.W. Drost

mentally affect natural systems and human recreation use. For human use, the most significant indicators are coliform bacterial levels.

The saline waters north of Everett Harbor contain high levels of sulfite waste liquor contamination from nearby lumber and pulp industry. These concentrations have reduced both fish and shellfish levels in the nearshore waters of the Tulalip Reservation. Tribal concern of this pollutant would be very difficult except through legal means since the pollution sources are off of the Reservation.

Tulalip Creek is relatively free from pollution. There is little organic pollution (phosphorus or nitrogen) in any of the Reservation water bodies. Both phosphorus and nitrogen were well below EPA recommended standards for drinking water at eight U.S. Geological Survey monitoring sites on Mission, Tulalip and Quilceda Creeks in 1975. Quilceda Creek and lower reaches of Mission and Tulalip Creeks occasionally have undesireably high levels of coliform bacteria. This usually occurs when high water tables and increased overland flow in winter months introduce coliforms from farm, pasture or forest lands.

In general, levels of freshwater pollution are not serious. Care must be taken during future development, however, to insure that degradation of the lakes, streams, and wetlands does not occur.

In 1979, Parametri, Inc., conducted a baseline study of the water quality of Tulalip Bay. Four water quality stations were monitored weekly from mid-April through June for general physical and chemical properties, algae pigments, and inorganic nutrients, sanitary microbiological analysis, metals, organic residues and other toxics. The bay was found to be a well-flushed

estuary with exceptionally clean waters. Inorganic plant nutrients and chlorophyll-A concentrations were moderately high, and indicate that the bay is a highly productive body of water. Some toxicants were found in the sampling program, but the source and significance are uncertain.

J. Climatology

The Tulalip Reservation has a moderate climate, typical of the Puget Sound Region, with mild, moist winters; cool, dry summers; and a modest temperature fluctuation over the day and over the year.

The Reservation is protected from harsh winter storms by the Olympic Mountains and those on Vancouver Island. The Cascade Range to the east affects the Reservation precipitation. Moist air moving east from the Pacific Ocean is forced over the mountains, where the decreased pressure causes cooling and condensation. The precipitation on the Cascade slopes is significantly higher than on Puget Sound and provides a significant runoff into the Snohomish River Basin, and ultimately the estuaries at the river mouth. This flow is important to the hydrology of the estuary. The flow carries sediment and organic matter which is deposited in the estuary and mudflats. This suspended sediment is an important factor in controlling the habitats found in the estuary.

During fall and winter, the area is dominated by low pressure disturbances which bring a flow of warm moist air into Western Washington. Cooling and condensation of this air brings rain which begins in late October and continues until February with few breaks. During this period, there is little temperature variation with daytime temperatures generally in the 40's and nighttime temperatures in the 30's.

During the summer months, high pressure dominates the weather patterns in the area, bringing a flow of cool, dry air into the area. The driest period of the year occurs between the middle of July and the month of August. The temperatures at this time of year average in the 70's during the day and the 50's at night.

The prevailing direction of the wind is southwest during the fall and winter, gradually shifting to west and northwest during the late spring and summer.

The mean rainfall for the area is 34.5 inches per year.

AVERAGE DAILY TEMPERATURE EXTREMES MONTHLY
AT EVERETT, WASHINGTON

	J	F	M	A	M	J	J	A	S	O	N	D	AVG
Max.	44.6	48.0	52.6	58.8	64.1	68.1	72.4	71.6	67.4	59.8	51.2	47.0	58.8
Min.	32.2	34.1	36.6	40.4	45.2	49.7	52.3	52.1	48.5	43.8	37.6	35.5	42.2

AVERAGE MONTHLY PRECIPITATION AT
EVERETT, WASHINGTON
(1956-1965)

J	F	M	A	M	J	J	A	S	O	N	D	TOTAL
4.97	4.07	3.28	2.44	2.00	2.18	.73	1.67	1.59	3.33	4.73	4.56	35.55

K. Mineral Resources

Limited amounts of commercial grade sand and gravel occur in scattered places on the Reservation. No significant deposits of valuable minerals are known. In the past, sand has been dredged from both Ebey and Steamboat Sloughs.

III. TRANSPORTATION AND NAVIGATION

The Reservation abuts Interstate-5 to the east with a major interchange at Marysville, and is bounded by Fire Trail Road on the north. Marine Drive is the major north-south access across the reservation from I-5 at the southeast corner, to the northwest corner of the Reservation at Fire Trail Road.

The Tulalip Test Site has direct access to the Burlington Northern mail line and an internal trackage system. North of the Reservation, Burlington Northern has been assembling acreage bordering the trackage in the Lakewood area and has considered extending a spur southward into the Reservation.

Tulalip Bay is presently a harbor for about fifty fishing boats belonging to tribal members. Various small pleasure craft are moored at small docks in the bay. Plans for a major marina in Tulalip Bay, to be developed by the Tribes, have been discussed for the past eight years. No immediate plans for construction of such a marina are being made.

IV. COMMUNICATION

The Reservation is served by General Telephone Company and the United States Postal Service. Radio and television reception is comparable to that experienced in adjacent parts of the country.

V. ENERGY GENERATION AND TRANSMISSION

There are no energy generating facilities on the Reservation. Snohomish County PUD maintains the transmission facilities and the Tulalip substation, west of Marysville on Marine Drive.

VI. SPECIAL CHARACTERISTICS OF THE RESERVATION

The Tulalip Reservation is endowed with several outstanding features which make it a desirable place to live and recreate and which will continue to significantly affect future development. Foremost is the 16 miles of salt water shoreline. Starting in the Snohomish delta marshlands and extending into Port Susan Bay on the northwest, the shoreline has several distinctly different characteristics.

Most of the shoreline is high-bank waterfront (7.2 miles) falling precipitously to a narrow beach at the bottom. Up to 300 feet high in places, these cliffs preclude access to the water, but do provide excellent views of the Sound, islands and mountains. In some high bank areas, steep ravines cut access points to the water. At the base of

some of the larger ravines, beachfront communities have developed on the narrow bench at the shoreline.

In other areas, notably at Tulalip Bay and Priest Point, the waterfront banks are more moderate and offer good access to the water. These areas have developed fully with both seasonal and year-round residences. Low-bank waterfront totals approximately 6.3 miles.

In the mouth of the Snohomish where the flat, low-lying uplands meet the water, the demarcation of tidelands is often difficult. These wetlands are often subject to flooding from both extreme high tides, on-shore winds and flood flows of the Snohomish River. There are about 2.5 miles of marshland shoreline, including the perimeter of islands in Ebey Slough.

In addition to the view property on the high beach bluffs, both of the high ridges inland on the Reservation offer truly spectacular prospects for views to the east and the Cascade Mountains, the south and Port Gardner Bay and Everett, and to the west over Puget Sound, Camano Island, and the Olympic Range.

VII. LAND USE, OWNERSHIP AND DEVELOPMENT NEEDS

A. Present and Planned Land Use

With few exceptions, the land within the Reservation is either vacant or used for permanent or seasonal residences. Residential development is highly oriented to salt water access wherever there are low banks along the south, or to views out over water.

There are four major areas of residential development on the Reservation shorelines. These are: Spee-Bi-Dah, Tulalip Shores, Priest Point and Tulalip Bay, including Tulalip and Mission Beach.

Inland, there are scattered clusters of housing around Lake John Sam and along Marine Drive, and roads leading off of it.

Of the residential areas mentioned, Tulalip Bay contains the greatest number of both permanent and seasonal homes. The bay area will continue to dominate the developed areas on the Reservation.

At Tulalip Bay, however, there are other important land uses. Tulalip Bay is the site of the fish hatchery and rearing ponds. The tribal fishing fleet is moored at Tulalip Bay and a small processing plant has been built by several tribal members. Other land uses on the Reservation are described in the sections on industrial and commercial needs.

The Tribes has plans to substantially expand the residential development at Tulalip Bay and at other locations on the Reservation. There are also plans to renovate an existing building on the waterfront into a restaurant and lounge. At some time in the future, the moorage facilities at Tulalip Bay will be expanded.

Institutional uses include the Sno-Isle Regional Library on the I-5 Frontage Road, the Tulalip Elementary School at Tulalip Bay, the Tribal Buildings, a fire station at the Bay and a Catholic Church.

B. Ownership and Development Needs

There are three types of land ownership on the Reservation: Allotted lands, owned by individual Indians; alienated lands, owned by non-Indians; and tribal lands, owned by the Tulalip Tribes. The Tribes is the single, largest land owner.

For many years, the Tribes has been actively pursuing development on the Reservation. Generating income and employment for tribal members is probably the single most important goal of the tribal community and the acquisition of land which can generate such opportunities has been a tribal objective since the formation of the tribal government in 1936. Soon after that time, the Tribes began to acquire land.

Starting with the purchase of a site at the headwaters of the old Tulalip Bay Water System, the Tribes has assembled about 6,000 acres of very valuable land; including the Boeing Test Site, Big Flats Industrial Fill, and a large parcel of land at Tulalip Bay. A primary source of the Tribes' income today is rental of these properties.

Much of the land that is owned by the Tribes is still undeveloped and because of its proximity to the Seattle Metropolitan area, and its natural beauty, these holdings represent an asset for the Tribes with enormous potential for development. Recognizing this potential, the Tribes began a formal planning program in 1969 and intensified their efforts to increase tribal income and employment on the reservation.

During the ensuing ten years, the Tribes has invested heavily in the community facilities necessary to support their long range development program. They have installed a sewerage system and treatment plant at Tulalip Bay to serve the existing homes and the future residences the bay area is capable of sustaining. The system has been designed for future expansion with a larger treatment facility.

The Tribes has developed a new water system, abandoning the reservoirs at Waterworks Road. They have dug three new wells and installed the new piping required to modernize the entire system.

The Tribes has constructed a new arterial serving the bay area which deletes the need for the old shore-hugging road along the bay. This road precluded access to the water by any upland land use.

Most of the original 22,000 acres comprising the Reservation are now in private non-Indian ownership. In

addition to the almost 6,000 acres owned by the Tribes, over 3,000 acres are held by tribal members. An undetermined area of tidelands is also owned by the Tribes.

The Indian ownerships range in size from as small as two acre parcels to some with several hundred acres. These Indian lands are scattered among the fee ownerships throughout the Reservation. Most of the shoreline of Tulalip Bay is owned by the Tribes. Hermosa Point, at the north end of the bay is an allotment, held by tribal members. The largest single holding of the Tribes is the 2,100 acre Boeing Test Site.

C. Development Constraints

The major constraints to development revolve around water, both quality and quantity. In order to protect the water quality of Tulalip Bay, all effluents, both residential and industrial, must be treated. The present treatment plant is nearing full capacity. To accommodate either increased development or increased load due to new effluent sources, the treatment plant will have to be expanded. The Reservation water supply is also limited. In the not so distant future, new water sources and expanded storage capacity will have to be developed before much more growth can take place.

VIII. POPULATION

The 1972 Comprehensive Plan forecasted a 1990 total Reservation population of 7,840. The most recent estimates by the Puget Sound Council of Governments show a 1990 population of 7,300 and a year 2000 population of 13,300. The present population is estimated by PSCoG at 4,668.

The Indian population of the Reservation has grown by over 30% since 1970; from 465 to 536.[1] This rate of growth is expected to continue as more employment opportunities are generated on the Reservation for tribal members.

[1]BIA Report on Labor Force, August 1979

The total population has increased by over 50% from 1970 to 1979. This rate was substantially higher than previously forecast, due to the rapid growth in housing in the past few years. As the housing supply begins to catch up with demand and as the costs of commuting increase, the rate of growth should slow somewhat but remain high, relative to other areas of the region.

IX. INDUSTRIAL NEEDS ON THE RESERVATION

Two specific tribal planning objectives, outlined in the Comprehensive Plan, relate to industrial development on the Reservation:

- Provide opportunities for Indian economic development
- Generate income commensurate with the value of tribal lands

The land lying west of Interstate-5 has long been recognized as potential industrial area. For more than a mile, the flat Marysville Valley extends into the Reservation, terminating at the foot of the steep ridge at the west. The soils are generally highly permeable, fine sandy loam, though poorly drained; it is a situation which could be corrected with the installation of a properly designed drainage system. The area can be served easily by power, gas, sewer and water. It has excellent highway and trail access. The areas indicated on the Tulalip Comprehensive Land Use Plan as industrial sites are:

- The Tulalip Test Site — A 2,000 acre parcel owned by the Tribes, adjacent to Interstate-5, immediately north and south of two interchanges. It is served by rail and water and can be served easily by sewer, if the demand is present. The site is leased to the Boeing Company, which tests and stores explosive ordinance. There are few sites of the size and quality under single ownership in the Seattle-Everett area compared to that parcel.

- Big Flats Industrial Land Fill — For over a decade industrial waste products from the City of Seattle have been barged to an island, owned by the Tribes,

in the mouth of the Snohomish River. The filling is now complete and there are approximately 150 acres of land available for industrial development. The property is bounded by navigable waters on the north and south, and to the east by I-5 and the main line of the Burlington Northern Railroad. In order to bring the site up to industrial qualities, power and sewer can be provided. a rail spur and improved highway access can also be constructed. A soils analysis including recommendations for construction techniques has been completed.

Other industrial activity is carried on on the Reservation at isoldated sites:

- A small boat building operation is located at Quilceda Creek near Ebey Slough
- Triway Manufacturing has recently purchased a 40 acre parcel near the I-5/Marysville Interchange, bordering on Ebey Slough. Their long range plans are to develop an industrial park. The first five acre parcel has been developed with their own manufacturing building and offices where items are machined for the airplane industry.
- A log storage depot and dump is located on the north bank of Ebey Slough just west of I-5. The waters adjoining this site have been used for log rafting for many years and cover a large portion of the mouth of the Slough.

While sites for industry, owned by the Tribes, are limited to the Test Site and Land Fill at Ebey Slough, the Tribes is interested in developing two major strategies for economic development on the Reservation:

- Seek the establishment of industry on suitable Reservation lands; and
- Develop tribally owned or controlled operations on tribal lands, particularly around Tulalip Bay. These projects might include:
  - A major marina to serve the Tribes' fishing fleet and pleasure craft
  - A fish rearing and fish processing operation
  - The housing and construction industry
  - Tourist facilities near the bay.

X. HOUSING REQUIREMENTS

Housing for tribal members has long been a critical problem facing the Tribes. The Comprehensive Plan was published in 1972, documenting substandard characteristics for most Indian housing and the need for a planned program of upgrading and adding to the supply of housing on the Reservation. The need to construct 75 new units and extensively renovate 33 units was noted. Additionally, housing for elderly tribal members and for foster children is a serious need. More recently, the Tribes has acknowledged the need to provide housing for young adult, single members of the Tribes.

The Tulalip Tribal Housing Authority was formed in 197 as the first step in beginning a housing program. new HUD funded units has been built near Tulalip Bay. Twenty-three, funded by loans from the Farmer's Housing Administration, are scheduled for construction on Quilceda Creek in 1980.

Other recent developments related to housing on the Reservation:

- Mission Cemetary Hill Development, which is partially developed with some roads paved, will provide new home sites for lease by the Tribes.
- The Tribes has discussed a mobile home park ordinance for the Reservation, though none has been enacted.
- A 37-acre parcel on Waterworks Road is being subdivided into five acre tracts by a private owner.
- Many other large acreage ownerships on the Reservation are being subdivided into five acre tracts. It is estimated that 500 acres are currently undergoing subdivision. No services are available for these lots. Septic tanks and individual wells will have to be used. Dynamiting, logging and grading are occurring with little control being exercised by the Tribes or the County.
- Subdivisions developed along Marine Drive near Tulalip Bay have been pushed too close to the

main highway. Should the full right-of-way ever be used to its maximum, the houses will be too close to the road.

The Tulalip Tribes owns several hundred acres of very valuable land at Tulalip Bay that is suitable for residential development. Almost all of the land is low bank waterfront or view property. The utilities are in place in the area, with a new sewerage system recently built.

XI. RECREATION AND OPEN SPACE

A. Existing Recreation Use

The Tulalip Reservation is historically a recreation area for Snohomish County. In the past, communities of summerhomes were built wherever access to the water was easy. These areas are now the communities of Spee-be-dah, Sunny Shores, Tulaire Beach, Mission Beach, Priest Point, and Tulalip Bay. Although most of these homes have been converted to permanent, year-round residences, many people still come to the Reservation for recreation along. Even though access is limited, the beaches attract picnickers and clam diggers. The water around the Reservation attracts large numbers of people for sport fishing and recreational boating. The Tribes also provides a put and take trout fishery in the upper Tulalip Creek rearing pond after the last release of juvenile salmon.

The uplands of the Reservation are almost wholly undeveloped and provide abundant wilderness with easy access. There are trails and old logging roads throughout the Reservation.

The Potlatch Grounds at Tulalip Bay has been reserved for tribal recreation use. This site fronts on the water and includes a ceremonial longhouse, social center for the Tribes' youth, children's playground, baseball field and the Neighborhood Service Center, which serves as the tribal office and indoor recreation center.

In 1977, the Tribes acquired a large tract of land that stretches from Port Susan Bay to Lake Weallup and leased it to the Port Susan Bay Camping Club. The site is now used for short term vehicular camping. Access to the saltwater beach and to Lake Weallup is restricted to members of the camping club.

B. Planned Recreational Development

In 1973, the Tribes prepared a Comprehensive Park and Recreation Plan which describes in detail the existing recreational opportunities and planned development. Three areas are of particular importance to the coastal area resources:

1. There is an insatiable demand for pleasure boat moorage in the entire Puget Sound region. Because of this demand, and the need to provide adequate facilities to support the Tribes' fishing fleet, the Tribes has planned to build a marina at Tulalip Bay. Several sites have been investigated and more detailed studies of the impact of such a facility on the waters of Tulalip Bay are required before a final location and plans are drawn.
2. As the population grows at Tulalip Bay, due to the tribal development of the uplands, there will be an increasing need to provide more beach and water access for the Tribes' leasees. Several sites at Tulalip Bay have been identified as potential park and water access points.
3. The wetlands at the mouth of Quilceda Creek are a valuable and unique natural habitat. This site has easy access from Marine Drive and as yet has not been threatened with development. The Quilceda Creek wetlands have been identified as a potential natural park area for passive recreation and wildlife study.

Although there has been little development to date on the five acre parcels, the development activity will surely pick up as the parcels are resubdivided into smaller, more marketable tracts.

The subdivision activity that has occurred is all on alienated lands over which the county now exercises jurisdiction. The issue of land use jurisdiction over alienated lands with the Reservation boundaries has not yet been resolved.

Illegal dumping of waste materials of all kinds is a continuing problem in the vacant open space lands of the Reservation. Because of the easy access by road, the relative isolation and lack of enforcement by all agencies with jurisdiction, several environmentally sensitive areas have been despoiled by this activity.

C. Open Space and Access

In both the Comprehensive Plan and the Park and Recreation Plan, the Tribes recognized the Reservation Open Space as a valuable natural asset. In the Comprehensive Plan, all areas of steep slope, poorly drained soils, all shorelines and the major drainage basins were identified as environmentally sensitive areas. The open space on the reservation provides visual amenity, recreation areas, wildlife habitat and stabilizes the hydrologic cycle of the surface waters of the reservation. Without these vast open spaces in their natural state, the coastal resources would be severly altered.

Over one-third of the reservation land was designated as open space in the Comprehensive Plan and was subsequently zoned Areas of Special Significance by the Tribes. This zoning classification will allow very low density development under controlled circumstances.

Access to the reservation open space is generally uncontrolled, which is both a benefit and a hazard. The easy

access allows the public to participate in the benefits of the natural resources of the open spaces on the reservation, but at the same time, easy access also encourages over use and development. In the recent bouyant housing market, many of the large privately held tracts of land on the reservation have been subdivided into five acre tracts. Under current county and state subdivision law, these small tracts can be resubdivided in five years from the original division.

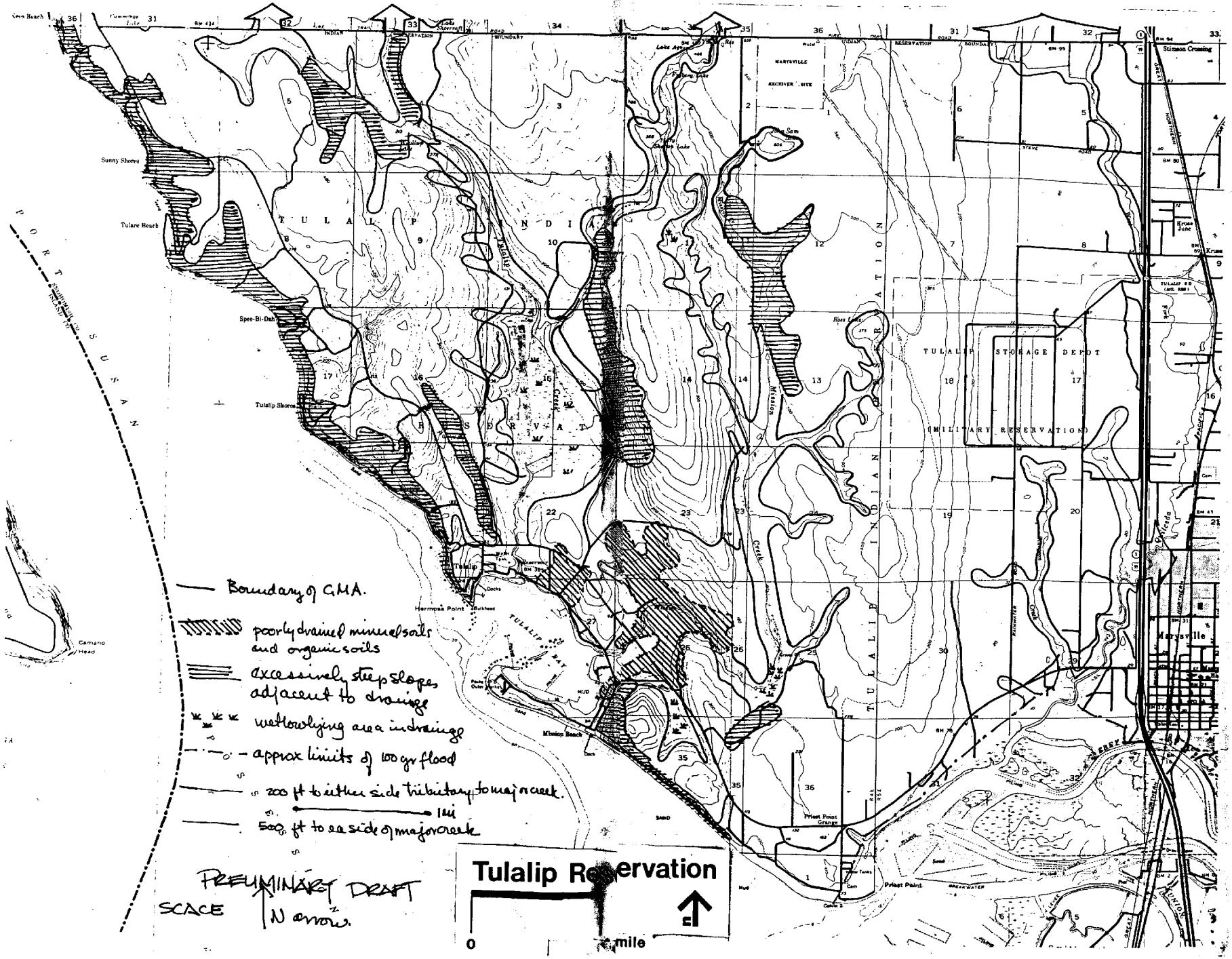
XII. COMMERCIAL FISHING

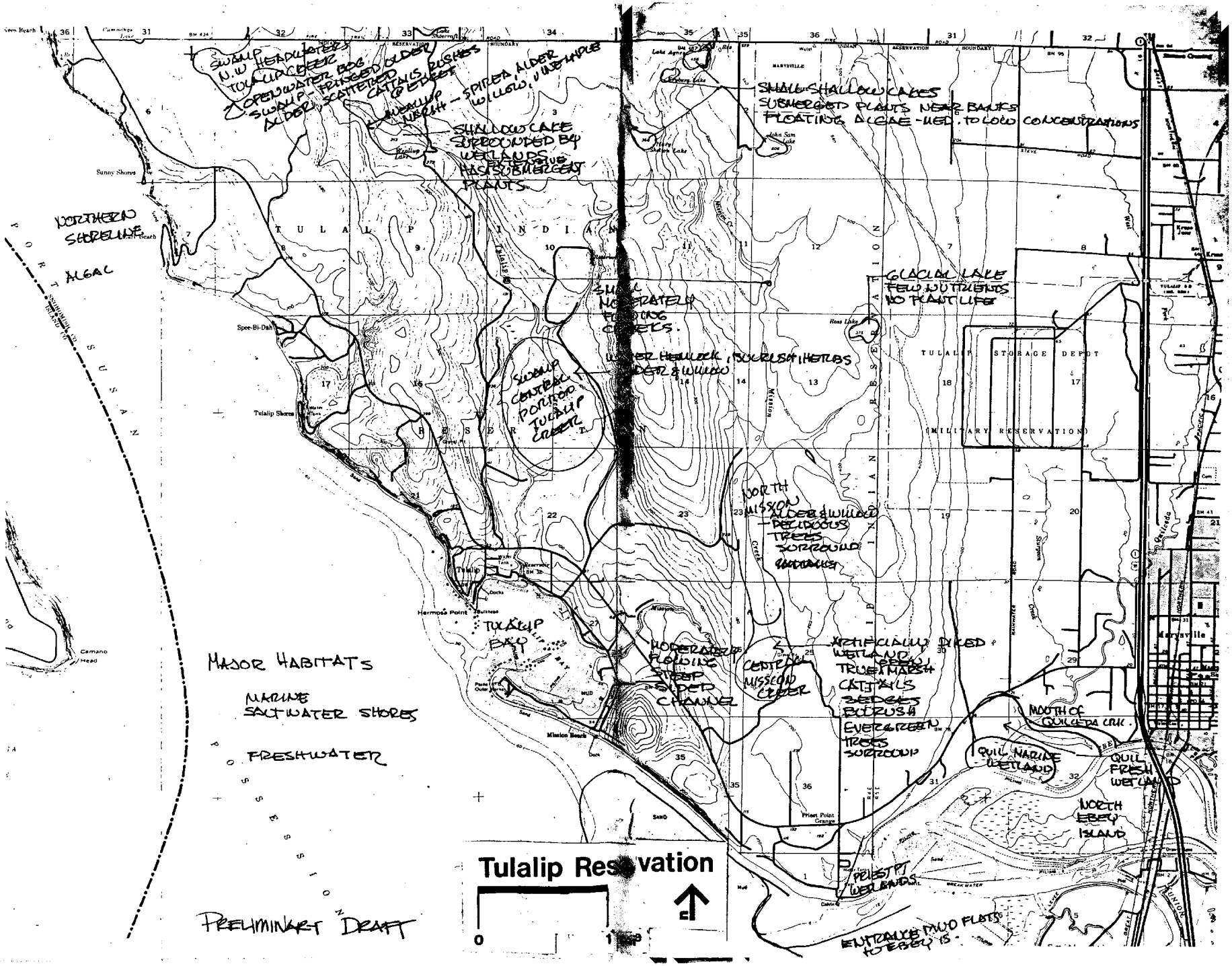
The waters of the Tulalip Reservation are significant producers of anadromous fish that are harvested by both commercial and sport fishermen. Four species of Pacific Salmon: Pink, Chum, Coho and Chinook, are harvested in the area. Other salmonids with a sizable run in the area are summer and winter Steelhead Trout, Searun Cutthroat Trout and Searun Dolly Varden. Port Susan Bay also supports s small Hake fishery.

For many years, the Tulalip Tribes has participated in a fisheries enhancement program and at present operates a substantial rearing program. Three large rearing ponds on Tulalip and Mission Creeks contribute over two million salmon to the Puget Sound fishery each year. The Tribes has secured grant funds of approximately $7,000,000 to construct a major hatchery capable of producing upwards of twenty million fish per year. Completion of that facility is now scheduled for 1983.

The Tulalip Tribes has established a fisheries division of the Tribal government. The Fisheries Division is responsible for both the enhancement and enforcement programs. A complete description of the fisheries activities of the Tribes may be found in the 1979 Annual Report of the Fisheries Division.

Fishing is by far the largest single source of income and employment of the Tulalip Tribes. Since the court decision


Boundary of GMA.
poorly drained mineral soils and organic soils
excessively steep slopes adjacent to drainage
wetland lying area in drainage
approx limits of 100 yr flood
200 ft to either side tributary to major creek.
1 mi
500 ft to sea side of major creek
PRELIMINARY DRAFT
SCALE
N error.
Tulalip Reservation
0
1 mile
TULALIP INDIAN RESERVATION
TULALIP STORAGE DEPOT
(MILITARY RESERVATION)
PORT SUSAN
Sunny Shores
Tulare Beach
Spee-Bi-Dah
Tulalip Shores
Hermosa Point
Tulalip
Mission Beach
Priest Point
Priest Point Grange
Camano Head
Marysville
Stimson Crossing


SWAMP N.W. HEADWATERS TOLALIP CREEK
OPEN WATER POND
SWAMP - FRINGED OLDER ALDER, SCATTERED CATTAILS, BUSHES & CREEK
SHALLOW LAKE SURROUNDED BY WETLANDS HAS EXTENSIVE SUBMERGENT PLANTS
SHALLOW LAKES SUBMERGED PLANTS NEAR BANKS FLOATING ALGAE - USED TO LOW CONCENTRATIONS
NORTHERN SHORELINE
ALGAE
MODERATELY FLOWING CREEKS.
WATER HEMLOCK, BULRUSH, HERBS ALDER & WILLOW
SWAMP CONTROLS PORTION OF TULALIP CREEK
GLACIAL LAKE FEW NUTRIENTS NO PLANT LIFE
TULALIP STORAGE DEPOT
(MILITARY RESERVATION)
NORTH MISSION ALDER & WILLOW DECIDUOUS TREES SURROUND
TULALIP BAY
MODERATELY FLOWING STEEP SIDED CHANNEL
CENTRAL MISSION CREEK
ARTIFICIALLY DIKED WETLAND MOSTLY TRUE MARSH CATTAILS SEDGES BULRUSH EVERGREEN TREES SURROUND
MOUTH OF QUILCEDA CRK.
QUIL NATIVE WETLAND
QUIL FRESH WETLAND
NORTH EBEY ISLAND
PRIEST PT WETLANDS
NEUTRALIZE TWO PLOTS EBEY IS.
MAJOR HABITATS
MARINE SALTWATER SHORES
FRESHWATER
PRELIMINARY DRAFT
Tulalip Reservation
0
1
Sunny Shores
Spee-Bi-Dah
Tulalip Shores
Hermosa Point
Camano Head
Mission Beach
Marysville
PORT SUSAN
TULALIP INDIAN RESERVATION

in U.S. vs Washington (The Boldt Decision), which reaffirmed the Indian rights to equal access to the fishery of the State, the Indian fishery has grown rapidly. In 1979 over 120 Tribal permits were issued for gill netting, set nets, beach sienea and round hauling. Not only are more Tribal members participating in the fishing activity, there has been a great increase in investment in the industry. Small, old and less efficient boats have been replaced by new, larger, well equipped vessels. Although there is no precise measure of fleet capacity, the fleet has grown substantially. A conservative estimate would be a doubling of harvesting capacity since the Boldt Decision in 1973.

XIII. WETLANDS AND ASSOCIATED AQUATIC LANDS IN THE TULALIP RESERVATION COASTAL MANAGEMENT AREA

The following discussion of the aquatic and wetlands habitat of the Reservation has been summarized from two resource publications: The Snohomish Estuary Wetlands Study by the U.S. Army Corps of Engineers; and The Tulalip Reservation Environmental Study, by the Triad Associates, 1977.

A. Wetland Characteristics

The federal government considers wetlands to be critically important natural resources for the people of this country, and as such, should be protected from unnecessary alteration or destruction. Wetlands have many definitions. For the purpose of this study, wetlands are defined broadly as areas which support a prevalence of vegetative or aquatic life, requiring saturated or seasonally saturated soil conditions. Areas specifically identified as wetlands include: swamps, bogs, sloughs, potholes, wet meadows, river overflows, mudflats and natural ponds.

Wetlands considered to perform functions important to the interests of the Tulalip Tribes are those which:

- Serve important natural biological functions, including food chain production, general habitat and nesting, spawning, rearing and resting sites for aquatic or land species;

- Are set aside for study of the aquatic environment or as sanctuaries or refuges;
- If destroyed or altered, would affect detrimentally natural drainage characteristics; sedimentation patterns, salinity distribution, flushing characteristics, current patterns, or other environmental characteristics;
- Are significant in shielding other areas from wave action, erosion, or storm damage;
- Serve as valuable storage areas for storm and flood waters;
- Are prime natural recharge areas, locations where surface and groundwater are directly interconnected; and
- Through natural water filtration processes, serve to purify water.

In the Snohomish Estuary Wetlands Study (Burrell, 1978), produced for the U.S. Army Corps of Engineers, a detailed and very thorough classification of the estuary wetland habitats was prepared. Much of the reservation shoreline was included in the mapping and classification developed in that study.

The study first identifies, describes and evaluates all wetlands in the Snohomish Estuary study area. The study area lands, wetlands, and aquatic lands are classified into seven different general habitat types: 1) Urban; 2) Agricultural; 3) Non-forested vegetated lands; 4) Forested uplands; 5) Water; 6) Aquatic lands; and 7) Other lands (vegetated spit). Each of these categories is further subdivided to describe the refined differences in habitat types.

Because the study is a valuable resource for site-by-site analysis of development impacts, it should be referred to for specific information.

B. Wetland Habitats on the Reservation

The following text summariezes the characteristics of habitat types found in the Reservation Coastal Management Area and for each of the locations which are of particular

concern to the Tribes. Appendix A provides a brief summary of each of the habitat classifications found in the reservation coastal area.

1. Salt water shorelines and the Coastal Area of the Tulalip Reservation are described as the wetlands and aquatic lands along the saltwater shoreline bordering Possession Sound including associated coastal beaches, Tulalip Bay, the mouth of Quilceda Creek and a portion of Ebey Slough and Steamboat Slough.

   The marine habitats in the nearshore area off the reservation are found to be generally low in plant species diversity, density and productivity.

   Along the more open northern shoreline, below the Kayak Point area, algal populations occur. Green algae is present nearest the beach, with a brown algal zone in deeper water. No detailed research has been performed in this area.

   The area from Tulalip Bay, south to the Snohomish River mouth provides the main shellfish habitat for the Snohomish Basin. This habitat has been degraded through high concentrations of sulfite waste liquor and other industrial and municipal contributions to poor water quality. Significant populations of Dungeness crab are known to exist from Tulalip Bay along Mission Beach and along the Snohomish tidal flats. Cockles, littleneck and butter clams are also found in significant numbers. The abundant and diverse populations of fish make the area important for both sport and commercial harvest.

   a) Tulalip Bay. Total Acreage: 364.
      This is the only protected saline bay on the Reservation shoreline. The area is an open space sand spit with associated tidelands. The lumber mill at Tulalip was the first major commercial activity in this area. It was purchased by the

government in 1955, to become part of the Tulalip Reservation.

At the north end of the bay is the Tulalip hatchery on Tulalip Creek. The hatchery is an important producer of salmon with a sizable return each year which are harvested as both a sport and commercial fishery.

Until recently, the broad expanses of mudflats in the southern part of the Bay were used for log storage. The mudflats may be inhabited by sediment dwelling detritovores. No studies have been done in this area. These organisms are an important food source to both juvenile salmon and other fish and also shorebirds such as dunlins and sandpipers. In addition, some dabbling ducks such as mallards and shovelers also feed on the detritovores.

The small fish that feed in the Bay are an important food item to herons, grebes, mergansers and other fish-eating birds. The spit at the mouth of the bay is a resting area for shorebirds and waterfowl and offers considerable security. The spit also acts as a wave break, protecting the bay shoreline from wave attack.

The habitat types in Tulalip Bay, identified in the Snohomish Estuary Wetlands Study, include:

54 Bay
622 Algal
623 Eelgrass
624 Salt Marsh
637 Sand-Silt Flats
638 Mudflats
711 Vegetated Spit

b) Jetty Island Mudflats. The main areas of importance are the eelgrass beds which occur from 100 to 300 meters offshore from Mission Beach to Priest Point in an area known as the Jetty Island Mudflats.

Eelgrass and algae are both highly productive species which contribute extensively to the aquatic ecosystem. This is the primary food source for the dense populations of detritovores inhabiting mud and sand flats. These detritovores in turn are the primary food source for herring, smelt, juvenile salmon and other small fish, and also a wide variety of shorebirds and waterfowl.

Eelgrass is a major spawning substrate for herring. Eelgrass also acts as a nursery habitat for salmon, smelt, herring, shad, sole and flounder. Crabs commonly feed in the eelgrass beds. The shallow flats are a critical schooling area for salmon and searun trout.

The Jetty Island Mudflats are presently open area, not used for commercial fishing because of shallow water. Sport boating takes place in the area. The habitat types identified in this area in the Snohomish Estuary Wetlands Study include:

54 Bays
622 Algal Assoc.
623 Eelgrass
637 Sand/Silt Flats

c) Entrance Mudflats to Ebey Island. Total Acreage: 470
There has been no diking of these exposed flats. Continuous use for log rafting has severely decreased the predominately secondary productivity. Intertidal flats such as these are highly productive as an important habitat for invertebrate benthos. Benthic organisms are an important food

source for salmon, shad, shorebirds and some waterfowl. These areas are used by juvenile salmon for feeding and schooling. Shad also uses the flats for a feeding and nursery area. Water flows across these flats to enter the sloughs, thus currents, salinity, and flushing are controlled in part by the configuration of these flats. Although the flats are heavily impacted by log rafting, research indicates a quick recovery after removal of the logs.

The southern portion, west of Smith Island, is in Snohomish County and is designated Conservancy in the SMP. It is recommended for preservation by the Snohomish River Basin Mediated Agreement. The northern portion, between North Ebey Island and Priest Point, is within the Tulalip Reservation boundaries.

The southern area is extensively used for log rafting and has pilings throughout. Nearby land areas have forest products industry and/or have been filled. The area is accessible by boat. The southern portion is privately owned; the northern portion is on the Tulalip Reservation. Development pressure for activities other than continued piling/log rafting is considered low.

Habitat types identified in the Snohomish Estuary Wetland Study include:

1532 Log Rafts
511 Estuarine River
62 Aquatic Land
622 Algae
6241 Sedge Marsh
638 Mudflat

d) North Ebey Island, On Tulalip Reservation, including Quilceda Island. Total Acreage: 207

Western portion of North Ebey Island was included as part of Tulalip Reservation in Treaty of 1855. No diking or logging has occurred on the island. The 160 acre sanitary landfill on the island was begun in approximately 1966. The landfill site is filled to capacity at present.

Most salt marsh species such as this one are highly productive. The marshes and swamps provide nesting and breeding for a variety of waterfowl and other birds. Cattail and bulrush provide nesting for raptors and songbirds. The inaccessibility of the area provides security for wildlife. Diverse habitats provide a variety of plant species for food and shelter. Aquatic interaction aids detritus expert and suspended sediment trapping. The area acts as a buffer, slowing discharge of landfill leachates into the aquatic system. The area has good examples of habitat zonation and successional sequence in marine and brackish wetlands. It protects the landfill from erosive wave action.

The area is wetland open space. The mudflats to the west are used for log storage; the landfill to the east has not yet been developed. The area is not readily accessible by road. Its location west of I-5 and its proximity to existing fill may contribute to pressure to develop this land.

Habitat types identified on North Ebey Island in the Snohomish Estuary Wetlands Study include:

572 Marine Slough
6111 Spruce Swamp
6241 Sedge Marsh
6242 Mixed Salt Marsh
6243 Mixed Salt Marsh

6244 Mixed Salt Marsh
6245 Sedge Marsh
6246 Bulrush Marsh
6252 Cattail/Bulrush Marsh
6253 Cattail Marsh

e) Mouth of Quilceda Creek. Total Acreage: 302
There has been very little activity in this area. A railroad spur once extended along the south shore. A portion of the south shore was bulkheaded and filled for log storage (tidal connection for remaining marsh was maintained.) The area is within the Tulalip Reservation boundaries. It is wetland/ open space and easily accessible.

The marsh communities are all highly productive. These diverse communities provide food, shelter and nesting area for a variety of wildlife. The proximity to a large wooded area provides feeding area for upland species. The dense vegetation provides security and protection for various wildlife. Juvenile salmon migrating down the creek begin schooling in the vicinity of Ebey Slough; these salmon feed on the benthic invertebrates found on the mudflats and along slough bottoms. The numerous drainage channels provide important aquatic interaction for trapping suspended solids and exporting detritus, thus aiding water quality and estuarine productivity.

This is the only example of salt marsh-brackish swamp-fresh marsh-upland zonation in the study area.

The Snohomish County Marysville Area Comprehensive Plan shows this area as greenbelt. The Snohomish County SMP designates it as Conservancy, and this has generally been accepted by the Tulalip Tribes. The City of Marysville SMP shows Conservancy on Quilceda Creek upstream of this area. This area has a unique nature and is valuable as a wildlife and fish habitat. There are archeologic sites in

this area. It is used by several school districts for field trips as a biological study area. Access and unique zonation make this an excellent research and education site.

Habitat types along the mouth of the Quilceda identified in the Snohomish Estuary Wetlands Study include:

572 Marine Slough
6111 Spruce Swamp
6241 Sedge Marsh
6242 Mixed Marsh
6243 Mixed Marsh
6244 Mixed Marsh
6245 Sedge Marsh
6246 Bulrush Marsh
6250 Brackish Marsh
6252 Bulrush/Cattail Marsh
638 Mud Flat

2. Freshwater Wetlands.

There are both still and flowing water freshwater habitats on the reservation..

Lakes. The lake areas are varied in type, ranging from Ross Lake which is deep and open, to Weallup Lake which is shallow and surrounded by wetlands. No research has been conducted on the freshwater habitats of the lakes other than field observation. Weallup Lake seems to have the only extensive areas of submergent plants. Pondweeds are prevalent. The lakes along the northern reservation border are small and shallow (John Sam, Agnes, Fryberg and Mary Shelton). These lakes may contain submerged plants near the banks as well as floating algae of medium to low concentrations. Nutrient levels are generally not high enough in these lakes to support substantial plant productivity.

Ross Lake is a glacially formed lake with few nutrients. Little or no algae or floating or submerged plants are

observed on this lake. Their absence is due to acidic conditions and low nutrient contributions from the surrounding watershed.

Streams and Creeks. The streams in the Tulalip and Mission Creek watersheds are small, moderately flowing creeks. Intermittent high nutrient and pollutant levels have been observed, particularly in Mission Creek, which could lead to growth of noxious algae under low flow or stagnant conditions.

The main freshwater wetland areas are: An artificially diked marsh area along Central Mission Creek; Marsh and swamp wetlands on Mission Creek below Ross Lake; A swamp at the central portion of Tulalip Creek; A marsh surrounding Weallup Lake; and a swamp at the northwest headwaters of Tulalip Creek along Fire Trail Road.

The freshwater wetlands are all in some way connected with Tulalip and Mission Creeks. Mission Creek contains an extensive marsh and swamp area below Ross Lake, extending south of the Turk Road Culvert. There is also a diked wetland in central Mission Creek. The creek itself is lined with a scattering of aquatic and emergent plants in the downstream portions. The Mission Creek wetlands will be described in detail here since they are typical of both streams.

a) Mission Creek

Along Mission Creek near the mouth of the stream is a moderately flowing, steepsided channel surrounded by mixed coniferous and hardwood forest. Typical streamside plants include bracken ferm, scouring rush, spleenwort and polypody ferns, with alder and bigleaf maple shrubs on the higher streambanks. The articificially diked wetland on central Mission Creek is more of a true marsh than the scattered streambank areas. This wetland is remote. It is located several hundred feet off

of an old logging road. The marsh is dominated by cattails, sedges and bulrush. Surrounding the marsh are thickly tangled shrubs, ferns and vines including gooseberry, vine maple, alder, blackberry, bracken fern and holly. Surrounding trees are alder, douglas fir, red cedar and hemlock. The swamp areas on northern Mission Creek have a somewhat different composition than the open marshland. Oregon alder and red willow are the predominate trees with cattail, Canadian burnet and angelica in more open areas. Thistle and goldenrod are prevelant in the near-marsh field areas.

b) Tulalip Creek

The Tulalip Creek wetlands are similar in nature to the swamps and marshes of Mission Creek. The central Tulalip Creek Swamp contains water hemlock, bulrush and a variety of herb species as well as the dominate alder and willow. Much of the swamp has been logged and other areas have rotted to such an extent that the majority of trees are standing dead as a result of water level fluctuations.

The wetlands around Weallup Lake and at the northwest branch of Tulalip Creek are swampy in nature. Weallup Lake is surrounded by tangles of spirea, alder, willow, vine maple and other thickly tangled shrubs. Marsh areas do exist at the northwest corner of the lake. The Wetland area near Fire Trail Road is an open water bog-swamp fringed with old growth alders, some with diameters of 26 inches or more. Scattered cattails and rushes surround the edges of this open bog.

3. Estuarine Habitats of Fish, Shellfish and Wildlife

a) Anadromous Fish. The Tulalip Reservation and adjacent waters are significant producers of anadromous fish harvested both by sport and commercial

fishery.

1) Salmon and Trout. Four species of Pacific Salmon: pink, chum, coho and chinook, use the Snohomish River for spawning. Other salmonids with a sizable run in the river include summer and winter steelhead trout and searun cutthroat trout. Searun Dolly Varden have also been reported.

   The lower Snohomish River estuary and Possession Sound play an important role in the development of both salmon and trout stocks. During upstream migration, salmon use of sloughs, with almost 60% of the fish moving through Union and Streamboat Sloughs.

   The river mouth and Port Gardner area are important as a nursery and schooling habitat for juveniles before they move out to sea. During the first weeks of near shore schooling, salmon populations are particularly susceptible to adverse environmental conditions. Mortality rates at this time will significantly determine the size of the adult return.

2) Shad. The Snohomish estuary may also be the spawning ground for American Shad, another anadromous fish. In other areas of Washington, shad are considered a valuable marine resource for commercial harvest.

3) Herring. Herring and longfin smelt use the lower Snohomish and its estuarine areas extensively for spawing and juvenile nursery areas. The eelgrass beds are important spawning areas for both. Large numbers of smelt larvae have been reported in the old river channel and lower ends of the major sloughs.

b) Non-Anadromous Resource Fish. Many species of non-anadromous fish are found in Snohomish estuary and Possession Sound. These include flat fish, perch, code and rockfish which are also taken for sport. Primarily commercial fish include dog fish, ratfish, hake, pollock. Hake is an important commercial fish in this area.

c) Non-Anadromous, Non-Resource Fish. Non-resource fish are predominantly small fish such as sculpin, gobies, sharks, eels and lampreys. These species are important in the aquatic ecosystem. Many are food for salmon or other resource fish.

d) Distribution of Fish in Study Area Waters. The sloughs are important migratory paths for anadromous fish. Near shore and in shallow water starry flounder, staghorn skulpin, sand lance, tom cod, perch, and juvenile species of sole, stickleback and gunnel can be found.

The drainage channels of intertidal marshes are habitat for juveniles, and small fish such as stickleback, sculpin and flounder.

West of Jetty Island, the intertidal flats are covered with eelgrass beds. These are important spawning areas for herring and skate. Juveniles of many species are also found in these beds. Adult pollock, perch and sculpin are found there also.

At Tulalip Bay, pilings and riprap structures provide a habitat for perch, rockfish, and probably other species associated with rock substrates.

Very little information is available on the fish around the solid rock substrates and rock outcroppings around the mouth of Tulalip Bay. They are probably similar to those reported at the south end of Gedney Island, which includes rockfish,

bocaccio, ling cod, rock sole, decorated warbonnet, prickleback, goby, painted greenling and a variety of sculpins.

The soft sediments of sand and mud between the tide flats and Gedney Island yield an abundance of fish for commercial and sport harvest, including sole, flounder, rockfish, hake, pacific herring, dogfish, walley pollock, sand lance, black cods and ling cod.

e) Shellfish and Other Invertebrates. Invertebrates in the area can be grouped non-taxonomically to reflect their functional distribution within the areas: Molluscs; crabs and shrimp; sediment dwellers; insects (and spiders); zooplankton.

1) Molluscs. The principal molluscs in the area are clams, cockles and mussels. A variety of snails and other gastropods inhabit some substrates. In the muddy-sand substrate, heart cockles and bent-nose clams are found. Some soft shell clams are found where a freshwater influx reduces the salinity. In muddy-sand substrates mixed with gravel, little-neck clams and butterclams can be dug for sport. In mixed sand and gravel, geoducks and horseclams can be found. On pilings and along rocky shores grow the blue mussel, fast becoming popular with seafood enthusiasts.

2) Crabs and Shrimp. Possession Sound is the home of red rock crab and Dungeness crab. Dungeness crab is usually associated with sandy and muddy substrates and can be found in eelgrass beds as well. Crab is harvested both commercially and for sport. Spot shrimp and pink shrimp are reported in the area but not enough are present for commercial harvest.

3) Sediment Dwellers. Sediment dwellers are a broad variety of benthic invertebrates, including worms and crustaceans. They are important first-order consumers in the detritus food chain. They are also a primary food source for many shore birds, juvenile salmon and other small fish. Corophiumspp, a filter feeding amphipod is found in abundance on the shallow mudflats.

4) Insects. Insects are the only upland invertebrates which play a significant role in the aquatic ecosystems of the estuary. The larvae of many insects are found in marshes, swamps and tideflats where they provide food for a variety of birds, small mammals and fish. The adult form of many insects are also an important food source.

5) Zooplankton. Zooplankton are a diverse group of microscopic organisms that feed on phytoplankton. Zooplankton are the first order consumers in the oceanic food chain and therefore constitute an important food for a variety of fish.

4. Wetland and Freshwater Inhabitants

A great diversity of fish species is not found in the wetlands, lakes and streams of the Reservation. Ross, Weallup and some of the smaller lakes have been occasionally or periodically stocked with sport fish, principally rainbow trout. No fish have been known to inhabit Ross Lake prior to the introduction of trout due to the lack of freshwater inflow or outflow.

The wetlands, although not too useful for fish, are primary habitat for a wide variety of birds and small mammals. Rare or threatened bird species in Western Washington, which have been observed on the reservation by the Pilchuck Audobon Society or from biological field surveys, include loons, grebes, heron, brant,

geese, a variety of ducks, mergansers, hawks, owls and many songbirds. The wetlands provide dense cover for songbirds even in winter months. Waterfowl and raptors (predatory eagles, hawks, owls, etc.) also use wetlands for food and breeding purposes. Up to six bald eagles at one time have been observed at Ross Lake and adjacent wetlands. Small furbearing mammals are also abundant in the marshes and swamps. Beavers, mountain beaver, river otter, mink, muskrat, raccoon and weasel make regular use of Quilceda Creek and the freshwater wetlands. Red fox, oppossu, striped skunk, chipmunk, cottontail rabbit, pocket gopher, Douglas squirrel, coyote and black-tailed deer make occasional use of wetlands for either food or cover in addition to their more normal upland habitat. A variety of reptile and amphibians including garter snakes, frogs and salamanders have also been reported on reservation wetlands.

Waterfowl and shorebird densities are seasonally high in both marine and wetland environments of the reservation. Offshore eelgrass beds provide particularly significant waterfowl habitat as do bulrush and cattail marshes along Quilceda, Sturgeon and Mission Creeks. In recent years, waterfowl populations in the Snohomish River Delta have been increasing, but the number of species has decreased, probably due to alteration of habitat and possibly pollutant effects.

Rare or unique species known to exist in near aquatic habitats are bald eagle, possibly osprey and Aleautian Canada Goose. In addition, the Arctic Peregrine Falcon and Eskimo Curlew may occasionally use the area as a migratory rest stop, although known sitings do not exist. Other birds which are rate, unusual or of threatened status in Western Washington are listed in Table 4.

No rare or endangered mammals are known to inhabit the reservation. Although reasonable siting information exists on birds, mammals, and waterfowl, no information has been gathered on the densities or estimated populations on these animals except for estimates by the Game Department of ruffled grouse populations.

P A R T T W O

COASTAL AREA MANAGEMENT PROGRAM

PART TWO

TULALIP RESERVATION COASTAL AREA MANAGEMENT PROGRAM

I. PROBLEMS, ISSUES, OBJECTIVES AND POLICIES

A. Problems and Issues

The fundamental problem in the coastal lands and waters of the Tulalip Reservation is the conflict between the necessity to maintain the highest quality water which will sustain the Tribes' vital fisheries program and the potential degradation of the water quality from development of other activities. This conflict is expressed in many different circumstances and in many different ways, but it remains the core of the Coastal Area Management problem. All other problems and issues are either directly related to the development of the fishery or are subordinate to it. Each of the problems and issues listed below can be ultimately related to this central issue.

1. Development of Tulalip Bay. Tulalip Bay is the center of the tribal activities and development program. The lands and waters of the bay area are one of the more important tribal assets and presently sustain a wide range of activities. The sheltered bay, with its protective bluffs and spit, gentle upland slopes, and surrounding view properties, has the potential for intensive development for tribal income and employment.

   At the same time, Tulalip Bay is the center of the Tribes' highly successful and growing fisheries program. The lands and waters of the bay support both the fisheries enhancement program, which contributes substantially to the annual salmon catch, and the tribal fleet, which harvests the catch. It is imperative that the waters of the bay be main-

tained to a level that will support the fishery program and only those other activities, which can be developed without significantly impairing water quality, can be allowed.

2. Maintenance of Natural Systems and Habitat Areas. Several areas of the Reservation are important contributors to the Snohomish esturine system and the natural salmon runs. The marshlands and tidal areas at the mouth of Ebey Slough and Quilceda Creek are examples of these areas and they must be protected.
3. Tulalip and Mission Creek Drainage Basins. Although they stretch for some distance from the salt water, these creeks provide the waters for the Tribes' rearing ponds and must be protected. Logging and other activities near these creeks threaten the fishery program.
4. Port Gardner Bay Water Quality. The coastal area of The Tulalip Reservation is an integral part of the Snohomish River esturine system. Recent water quality monitering of Tulalip Bay indicates that pollutants from the Snohomish River system are degrading Reservation water and threaten the full use and enjoyment of the tribal resources.
5. Lack of Baseline Data. In spite of all the study effort of the Snohomish estuary, there is almost no data available on the present state of the Reservation waters. With the exception of a tribally sponsored water quality study of Tulalip Bay[1], there has been no systematic evaluation of monitoring of water quality on the Reservation by any agency.
6. Lack of Appropriate Water Quality Criteria. Very little is known about the biological effects of cumulative changes in water quality on fish. There

[1]Parametrix, Inc. Water Quality and Fishery Investigations in Tulalip Bay, Washington. 1978

are no difinitive minimum standards against which proposed development in the coastal area can be judged.

7. Jurisdictional Authority. There are many agencies which exercise jurisdiction and influence over the management of the Reservation coastal area. Some agencies which purport to exercise control in fact do not; thus leaving a jurisdictional vacuum. Recognition of the Tribes authority by other regulatory agencies is a major problem in management of the coastal resources.

8. Intergovernmental Coordination and Cooperation. Because so many agencies have an interest in the management of the coastal resources, it is imperative that these agencies cooperate to the fullest. Partly becuase of a lack of understanding of Indian problems in general, Indian tribes have often been looked upon as junior partners in resource management programs by other agencies. This unfortunate attitude has lead many agencies to be particularly insensitive to the needs of the reservations. There must be a process which will:

   a. Identify environmental problems and thoroughly evaluate the impacts of contemplated activities;
   b. Provide for expeditious conflict resolution among the agencies resulting in judgements based upon a balance of all interests;
   c. Provide for clear jurisdictional boundaries and joint or coordinated regulation of the regional resources;
   d. Administer the regulations in an efficient, quick and responsive manner without imposing great costs on the users of coastal area resources.

B. Objectives of the Coastal Area Management Program

Natural resources have no intrinsic value apart from the values that man attributes to them. We seek to conserve, protect and enhance natural resources because it is to our benefit to do so. The coastal areas of the Reservation provide the Tribes with a flow of benefits and the Tribes seek to maximize those benefits. Therefore, the objectives of the Tribes Coastal Area Management Program are:

1. Preserve the natural state of the coastal area in so far as it enhances the natural resource base and furthers the tribal goals of self determination;
2. Protect the natural resources of the coastal area from degradation;
3. Conserve limited coastal area resources for long range, efficient resource use;
4. Restore coastal areas to their natural state where restoration will maximize the resource benefits;
5. Where possible, enhance coastal area resources to increase coastal area benefits;
6. Develop the coastal area in a manner that will maximize benefit over the long term and avoid development which may conflict or preclude optimum use of the resources.

C. Coastal Area Management Policies

In setting policies for coastal area management and development, the Tribes recognize that no rules, guidelines, criteria or statements of policy can be applied inflexibly. The complexity of the management task defies simple solutions. There are many competing, worthwhile uses of the coastal area and a balance must be struck between them.

1. General Policies.
   a. Preserve the coastal area in its natural state when it is necessary to the maintenance of the coastal resources.

b. Preserve the coastal area in its natural state when the contribution to the coastal resources exceeds the benefits from alternative uses.
c. Require full evaluation of the existing conditions and impacts of all coastal management area development and activities.
d. Restrict development and activities to the coastal areas where the impacts would be minimized.
e. Where feasible, devise and adopt detailed development and performance standards.
f. Require design and development practices which will result in the least adverse impacts on the coastal area resources.
g. Require continuous monitoring of development and coastal area activities with potential for adverse environmental impacts.
h. Vigorously enforce all regulations of use of the coastal area.

2. Policies for Protection of Natural Systems.
   a. Prohibit use of natural areas when the activity would result in substantial and irreversible loss of the resource benefits of the natural environment.
   b. Seek feasible alternatives to uses of natural coastal areas which would result in adverse environmental impacts or diminish the benefits of the natural systems.
   c. Protect existing beneficial uses of the coastal area from encroachment of less desireable uses.
   d. Seek and permit desireable uses of the coastal area.
3. Policies for Preservation.
   a. Prohibit use and development in areas necessary for the maintenance of coastal area resources.
   b. Preserve coastal areas of unique, cultural, historice or scenic values.

c. Preserve coastal areas of habitat for unique and endangered wildlife species.

4. Policies for Restoration.
   a. Wherever feasible, coastal areas will be restored to the natural state.
   b. Wherever feasible, cultural, historic and scenic areas in the coastal area will be restored to their original state.
   c. Abandoned, deteriorating and obsolete developments in the coastal area will be removed and replaced with uses compatible with the natural coastal area.
5. Policies for Enhancement.
   a. Wherever feasible, natural productivity of the coastal area will be enhanced by restoration of damaged or supplementary man-made improvements.
   b. Where compatible with the natural system and existing use, access to the coastal area will be provided to enhance enjoyment of the resource.
   c. Educational programs will be encouraged to enlarge the understanding and enjoyment of the coastal area.
   d. Scientific study of the coastal area will be encouraged to develop better methods of managing the coastal area and enhancing mans use of the resources.
6. Policies for Conservation.
   a. Encourage the uses of the coastal area which develop renewable resources and discourage uses which consume finite coastal area resources.
   b. Encourage those uses which maximize long term benefit rather than short term goals.
   c. Encourage those uses which use coastal area resources efficiently.
   d. Encourage those uses which are compatible with other coastal resource uses and do not preempt the resource for a single purpose.

e. Encourage uses which do not require an irreversible or irretreivable commitment of the coastal area resources.

7. Policies for Economic Development.

a. Water dependent and water oriented economic development will be encouraged in the coastal areas capable of sustaining the activity without damage to the natural resource.

b. Economic development which is neither water dependent nor water oriented will be prohibited from the coastal areas.

c. Resource dependent economic development will be permitted in the coastal management area.

d. Propcsals for economic development in the coastal area must demonstrate significant net benefits over less intensive alternative uses of the coastal area.

e. Economic development which provides significant employment and income opportunities for Indian ownership and tribal revenues will be encouraged.

II. COASTAL AREA BOUNDARIES AND AREAS OF CONCERN

A. Boundaries of the Coastal Management Area

The boundaries of the Coastal Management Area are intended to include both the lands directly influenced by the marine environment and those lands which will have a direct and significant influence on the coastal area resources. The Coastal Management Area is defined as the coastal area (the wetlands, intertidal zones, and marine waters of the Reservation) and the uplands which have a significant relationship with the coastal area. These lands, necessary for management of the coastal resources, include:

1. All Reservation lands below the line of extreme low tide and the waters over them;
2. All tidelands to the line of extreme high tide and the waters over them;

3. All lands abutting the tidelands which are strongly influenced by the marine environment to a depth of 200 horizontal feet from the line of extreme high tide;
4. All wetlands defined by the EO 11990;
5. All lands abutting the coastal area which are subject to the actions of the coastal area natural systems or other natural systems (coastal bluffs, slide prone areas, ravines);
6. All lands which substantially influence the coastal waters and coastal area resources (Tulalip, Mission and Quilceda Creek Drainage Basins);
7. All areas of concentrated development abutting the coastal area.

B. Areas of Particular Concern

1. Criteria for Areas of Particular Concern. The coastal areas on the Reservation that are of particular concern are listed below because each meets at least one of the following criteria:
   a. The area is unique becuase of the habitat it provides, the physical features, historic or cultural assets or scenic value.
   b. The area is of exceptionally high natural productivity and contributes significantly to the coastal area food web.
   c. The area is now used for active recreation or has significant potential for recreation development.
   d. The area does or can support water dependent development.
   e. The area has unique geographic features that suit it for industrial development.
   f. It is an area of urban concentration.
   g. It is an area susceptible to natural hazards.
   h. The area contributes significantly to the operation and maintenance of a ntural system which supports coastal area resources.

2. Designated Areas of Particular Concern. Several of the areas listed below have a number of the criteria for areas of particular concern; others only one. The Reservation coastal areas listed here as areas of particular concern are those which warrant special attention.

a. Tulalip Bay.

Tulalip Bay has unique characteristics in the Snohomish estuary system. It is the only natural, protected bay, guarded by high, stable bluffs and a sand spit stretchning across the entry. The spit acts as a natural breakwater and shields the inner bay shorelines from the wave action of Port Gardner Bay. At the same time, the sand spit dissipates the wave energy causing the suspended silts from the Snohomish River to deposit in the inner bay. Tulalip Bay has high quality water, designated as Class A by the State of Washington, and is an integral part of the tribal fisheries enhancement program. At the same time, the bay is the center of the Reservation's urban activities and supports a wide variety of uses: residential, commercial, recreational and institutional. The bay is the base of the rapidly growing tribal fishing fleet and the Tribes has extensive plans for continued development of the bay area.

Tulalip Bay is the principal natural asset of the Tulalip Tribes. Because of the existing concentration of the urban uses and the development potential of the site for tribal programs, water quality is the primary concern at Tulalip Bay. The Tribes must be assured that planned development at Tulalip Bay will not cause significant degradation of the waters and jeopardize the fishery.

b. Ebey and Union Slough Wetlands.

The wetlands at the mouths of Ebey and Union Sloughs provide a rich habitat for a wide variety of wildlife and are significant contributors to the food web. Upstream sources of pollution are a problem for this highly productive natural area.

c. Quilceda Creek and Associated Wetlands.

The Quilceda Creek area is a remarkably varied transitional area; highly productive and filled with wildlife. Because of the easy access to this area, it has particular significance as a scientific, educational and recreational resource. For the same reason, the Quilceda wetlands have been the site of indescriminate dumping of all kinds of wastes and encroachment of development. Upstream construction and generation of pollutants has resulted in deteriorating water quality and damage to the natural environment.

d. Big Flats Land Fill.

The completed land fill on Ebey Island represents both an opportunity and a potential problem. Leachates from the fill contribute to the pollution load of Port Gardner Bay. Little known of the nature or quantity of the leachate or its effect on the surrounding wetlands and waters.

The landfill site is also a prime potential industrial location. It is well served with road and potential rail access, secure from flood damage, and has water access. The Big Flats site has been planned for industrial development for many years and may provide significant employment and income to tribal members.

e. Tulalip and Mission Creek Drainage Basins.
Tulalip and Mission Creek are the sources of water for the Tribes fish rearing ponds and are an indispensible part of the fisheries program. The drainage basins of these creeks have been the site of continued logging. Although the development pressures in these drainages has been slight, unless activity in the area is closely regulated and monitored, there could be serious degradation of the waters of these creeks and a threat to the fisheries program. Diversions, blockage of flows, alteration of the basin hydrology could also jeopardize the Tulalip fisheries program.

f. Beachfront Settlements.
Continued development in and around the estab-lsihed beachfront communities of Spi-bi-Day, Tulare Beach, Tulalip Shores, and Priest Point could result in pollution of the coastal area and shellfish from septic tank effluents and further encroachment by filling. Access to the beaches and tidelands in these communities is often restricted and discouraged. Bulkheading in several locations is failing and both erosion and flooding are present hazards.

g. Bluff Top Development.
Most of the coastal area of the Reservation is high bluffs. In some areas, the bluffs contain unstable soils. Development at the tops of these unstable areas results in increased subsurface waters from septic tanks which lubricate the soils and cause increased sluffing and slumping. This action, along with the natural undercutting by beachfront wave action, may lead to severe slide and erosion conditions. Bluff top development must be controlled and monitored.

III. AREAS AND FACILITIES OF NATIONAL INTEREST

The Coastal Zone Management Act[1] requires that facilities of national and regional interest must be accommodated in the planning process, and must not be unreasonable restricted. Because of the wider interests involved, all agencies with responsibility should be encouraged to support the development of facilities of national interest. On the Tulalip Reservation there are two types of facilities of national interest.

A. Fishery Enhancement Program

The first type is the fisheries enhancement complex at Tulalip Bay. Following the courts decision in United States v Washington, upholding the Indian treaty rights to access to the fishery, a federally established fisheries management system was set in place. Concurrently, with the management system, an extensive, federally supported fisheries enhancement program was launched. The fish propagation facilities, which have been installed over the years at Tulalip Bay, and those that are now in the planning stage, are an integral part of the federally assisted enhancement program.

B. Economic Development

The second type of facilities of federal interest are the tribal and other Indian investments in projects for economic development. In 19 the Indiance Self-Determination Act[2] set out as federal policy, the right of Indians for governmental self-determination and economic self-sufficiency. To this end, the government has provided financial and technical assistance to the Indian people to develop the means of generating income and employment. The development program of the Tulalip Tribes, which includes land development, business ventures, public facilities and other programs in support of its members, is a direct expression of the federal interest in Indian self-determination.

[1] 16 U.S.C. 1451 et.seq.

[2]

IV. POLICIES FOR PERMITTED USE

A. The coastal area resources of the Reservation are the major source of income and employment for tribal members. It is the policy of the Tribes to use these resources to the fullest extent possible consistent with the long term maintenance of the resources.

B. The coastal area of the Reservation can accommodate and support a wide variety of uses; each of which contributes to the Tribes' goals of self determination and self sufficiency. The Tribes will seek a balance of resource use and development.

C. Recognizing that some uses of regional and national benefit may not directly contribute to the Tribes' goal of self-determination, the Tribes will not unreasonably restrict such uses in so far as they do not preclude or threaten tribal use of the coastal area resources.

D. The coastal area in its natural state, is a rich provider of resources for the Tribes. Unless it can be demonstrated that any proposed use or alteration of the natural state of the coastal area will result in overall, substantial and sustained benefits to the Tribes, the use will be restricted or prohibited in the coastal area.

E. The coastal area of the Reservation is a part of the historic and cultural heritage of the Indian people. Any use which tends to diminish this heritage must be justified by substantial contribution to other tribal goals.

F. The natural beauty is a major component of the coastal area and its value to the Tribes. Every effort will be made to insure that permitted uses will contribute to the aesthetic quality of the coastal area.

V. PERMISSIBLE LAND AND WATER USES

The permitted land and water uses in the Coastal Management Area are classified into three broad categories below. The

specific uses within each area designated in the Coastal Area Management Plan are set out in the controlling regulations in Ordinance 35.

A. Water Dependent Uses

1. Marine resource use: propagating, raising and harvesting fish and shellfish.
2. Activities which aid or protect natural systems in producing marine resources.
3. Activities and uses necessary for the health, safety and welfare of the people of the Reservation.
4. Non-consumptive water uses, such as recreation, educational, scientific and aesthetic enjoyment.
5. Water dependent commercial and industrial use. Activities which require direct contact with the water, such as fisheries support facilities, marinas, marine transportation, utilities and water borne commerce.

B. Water Oriented Uses

1. Uses which require direct access to the water as an integral part of their function. Fish propagation facilities, repair and support facilities for the fishing fleet.
2. Recreational uses requiring public access to the water.
3. Commercial and industrial uses requiring water access.
4. Developments requiring high amenity. Cultural facilities, places of public accommodation and entertainment, and housing in urbanized areas.

C. Non-water Dependent or Water Oriented Uses Permitted

1. Facilities necessary to protect the public from natural hazards, such as erosion, landslides and flood control.

2. Uses which are non-consumptive, non-degrading of the environment and do not preempt the resource for other uses.
3. Uses which enhance marine resources.
4. Scientific research.
5. Uses which foster the fishery.
6. Resource dependent activities.
7. Water dependent commerce and industry.
8. Uses which preserve, conserve or enhance natural systems.
9. Uses which preserve, conserve or enhance historic, cultural or archeological resources.
10. Water oriented resource enhancement and support facilities.
11. Water oriented commerce, industry and cultural facilities.
12. Water oriented recreational facilities.
13. Residential development.
14. Non-water oriented permitted uses.

VI. METHOD OF EVALUATION

Because of the importance and sensitivity of the Reservation Coastal Area, all proposed uses must be evaluated to the extent that the Tribes can be reasonably certain that the use will not be detrimental. To achieve this level of certainty, the following procedure will be used in evaluation of proposed uses of the Coastal Management Area.

A. Project Description

A complete written and graphic description of the proposed use will be submitted. Wherever possible, the project characteristics will be quantified. The description will include: the size, shape and location of any structures; the size, shape and location of any alterations to the physical environment; the nature, frequency and duration of activities associated with the project; the benefits expected of the proposed use; and the

special requirements and constraints of the proposed use that require a coastal area location.

B. Background and Baseline Data

The applicant will submit a complete description of the coastal area setting in which the use is proposed. It is the responsibility of the applicant to contact and collect the pertinent data from all private, federal and state and local agencies that is readily available. Background and baseline data will include:

1. A complete description of the physical characteristics of the area, addressing those elements of the environment listed in the State Environmental Policy Act (WAC 197-10-444).
2. The applicant shall describe the relationship between each element of the environment and the proposed use.

C. Capability Analysis

Each Coastal Management Area proposal shall contain an analysis of the capability of the environment to sustain the present resources and identify the critical factors for maintenance of the environment. The capability analysis will set out all known and adopted environmental standards and criteria pertinent to the project and identify their source.

D. Impact Analysis

Each Coastal Management Area proposal shall include a detailed statement of the anticipated impact of the use on each element of the environment that is applicable. The statement shall stress quantitative measurements of the impacts and will include cummulative and secondary, as well as direct, effects. Potential adverse impacts will be described as to magnitude, frequency and duration. When the possibility of adverse environmental impacts is apparent, the probability of occurance will be stated in as precise terms as possible. When the available information to analyze

the potential impacts on the environment is insufficient, the applicant shall describe an appropriate method of collecting and analyzing the required information and the costs of obtaining it. The impact analysis shall also include a description of the project features designed to mitigate adverse impact, features designed to enhance the coastal area resources, additional and alternative measures that might mitigate adverse impacts, and the cost and effectiveness of these efforts.

E. Project Evaluation

Upon receipt of all the information deemed necessary to evaluate the proposed Coastal Management Area use, the Tribes will evaluate the proposal guided by the following principles:

1. All uses of the coastal resources must be in accordance with the Tribes stated goals and objectives for coastal area use and development.
2. The benefit of the use must be reasonably balanced against its detriments. The project must reasonably demonstrate that the benefits expected from the proposed use outweigh both the probable adverse consequences of the use and reasonable alternative uses of the resource which would be precluded by the proposed development. The alternative uses considered must be identified in the plans of the Reservation and be reasonably achievable.
3. The evaluation of possible impacts will be based upon a balancing of the probability of occurance and the expected magnitude of the impacts anticipated. The greater the adverse impact potential, the lower the acceptable probability.
4. The Tribes will not required rigid adherence to arbitrary environmental standards, but will demand the level of compliance necessary to sustain and protect the resource.

5. All interested will be considered and balanced: environmental, economic, social and cultural; tribal, federal, state and local. The evaluation will cite the adopted policies of all interested parties and indicate the degree in which the proposed use supports or conflicts with those policies.
6. When reasonable locational and development alternatives exist, the proposal which is least disruptive to the natural state or consumptive of coastal area resources will be favored.

VII. MEANS OF CONTROL

A. Organizational Structure

The Tulalip Tribes of Washington is a federally chartered government established under the provisions of the Indian Reorganization Act of June 18, 1934 (225 USC 468 et. seq; 48 Stat 984). The Tulalip Tribes adopted a constitution in 1936 which provides for a Chairman and Board of Directors as the governing body of the Tribes. The Tribes employs a professional staff to conduct the daily business of the Tribes (organizational chart).

B. Legal Authority to Regulate and Acquire

Under the provisions of the Constitution (Art. VI & VIII: Charter, Sec 5), the Tribal government has the authority to lease tribal lands; purchase lands; levy taxes and license fees; to exclude from the Reservation persons not legally entitled; to maintain law and order; to conduct business with land for profit; and regulate the use and disposition of property[1].

C. Regulatory Measures

In July of 1973, the Tulalip Tribes adopted Ordinance 35, the Reservation Zoning Ordinance. This ordinance establishes the Comprehensive Plan as the land use guide for reservation development, provides for zoning districts with restricted uses, establishes development

[1]For a complete description of the legal authority of the Tribes to exercise land use controls, see Appendix A of the Comprehensive Plan, Tulalip Reservation.

standards and a permit system for development control. The Zoning Ordinance is administered by a Hearing Examiner appointed by the Board of Directors. His duties include: Issuance of use and occupancy permits; hearing variances and conditional use permit applications; amendments to the Zoning Ordinance and Comprehensive Plan and amendments to the Zoning Map (rezones). The actions of the Hearing Examiner and appeals from his decision are heard by the Board of Directors.

Ordinance 35 is to be amended by adopting the Coastal Area Management Plan as a component of the Comprehensive Plan and requiring the Hearing Examiner to use the policies and methods of evaluation in the Coastal Area Management Plan on all proposals that fall within the Coastal Management Area.

D. Notification of the Public and Interested Parties

Public notification by publishing and posting is required by Ordinance 35 for any action regulated by the Zoning Ordinance. When any action is to be taken under Ordinance 35, which is loacted in the Coastal Management Area, or will have a significant affect on the coastal area resources, all "agencies with jurisdiction" as defined in the State Environmental Policy Act (197-10 WAC), will be notified. These provisions along with the A95 process for federally assisted actions, will provide ample notice to all parties with an interest in the management of the coastal area.

E. Consultation and Coordination with Other Agencies

The Tulalip Tribes is a member of the Puget Sound Council of Governments, Snomet, the Regional Water Quality Advisory Council, and many other intergovernmental coordinative bodies. The Tulalip Tribes has maintained excellent working relations with all levels of government over the years and is in continuous contact with

interested agencies. In addition to formal notification requirements such as A95, these less formal contacts provide a working forum for exchange of views and concerns.

During the review period, and in the hearing process, all agencies and interested parties will have the opportunity to participate. At this time, conflicts between the parties can be identified, additional information developed, solutions proposed and conflicts resolved.

The list of federal and state regulatory citations listed in Appendix indicates the extend to which the management and concern over the resources is shared. In addition to those listed, Snohomish County throughout its zoning and subdivision regulations, Shorelines Master Program, and other governmental operations, also influences coastal area development. However, it must be pointed out that because of the unique status of tribal governments, the extent to which many of these agencies exercises the jurisdiction under the authorities cited is uncertain.

F. Standards Adopted

Before issuance of any permit or approval under Ordinance 35, the Hearing Examiner must require full documentation of the proposed action and may require all measures necessary to further the purposes of the Ordinance and the Coastal Area Management Program. To evaluate the proposals and determine the significance of the impacts the use or activity may have on coastal area resources, the Tribes may adopt standards and criteria. Principal among these are the Federal Air and Water Quality Control Act which are incorporated into this program.

APPENDIX B

STATE AND FEDERAL COASTAL AREA REGULATIONS

Revised Code of Washington (RCW) listings:

RCW 43.20, Public Health, Department of Social and Health Services
RCW 43.21c, State Environmental Policy Act
RCW 43.30, Department of Natural Resources
RCW 43.51, Parks and Recreation Commission
RCW 56 and 57, Sewer and Water Districts
RCW 75, Department of Fisheries
RCW 76, Department of Natural Resources
RCW 77, Department of Game
RCW 79, Department of Natural Resources
RCW 85.05 and .06, Diking and Drainage Districts
RCW 89.08, Conservation Districts
RCW 90.48.260, Department of Ecology
RCW 90.58, Shorelines Management Act
RCW 352.32, Parks and Recreation Commission

Code of Federal Regulations (CFR) listings:

15 CFR 920, 923, NOAA/NMFS Grant Regulations
33 CFR 209.320-329, U.S. Army Corps of Engineers Regulations
36 CFR 800, Historic Preservation Review
40 CFR 115.220-229, 230, Environmental Protection Agency Regulations

Washington Administrative Code (WAC) listings:

WAC 173-220, National Pollutant Discharge Elimination System (NPDES) Permits
WAC 197-210, State Environmental Policy Act (SEPA) Guidelines
WAC 232, Game Regulations
WAC 332, Department of Natural Resources

United States Code (USC) listings:

16 USC 1531-1543, Endangered Species Act of 1973

Federal Register (FR) listings:

FR 40, 231, December 1, 1975, U.S. Fish and Wildlife Service

Public Law (PL) 92-500, Federal Water Pollution Control Act and Amendements

APPENDIX C

REFERENCES

Department of Commerce, Coastal Zone Management Program, Administrative Grants, Notice of Final Rulemaking, Federal Register Vol. 40 No. 6 Part 1, Thursday, January 9, 1975.

Drost, B.W., WATER RESOURCES OF THE TULALIP INDIAN RESERVATION, U.S. Department of Interior, Geological Survey, Tacoma 1977.

Department of Ecology, APPLICATION TO THE SECRETARY OF COMMERCE FOR APPROVAL OF THE STATE COASTAL ZONE MANAGEMENT PROGRAM, Olympia 1975.

Jermann, Jerry, ARCHEOLOGICAL POTENTIAL IN TULALIP BAY, University of Washington, 1975.

The Latourelle Associates, COMPREHENSIVE PLAN, TULALIP RESERVATION, Seattle, 1972.

IBID/Calvin Jordon Consultant, PARK AND RECREATION PLAN, TULALIP RESERVATION, Seattle, 1973.

IBID, DEVELOPMENT PROGRAMS AND STRATEGIES: TULALIP RESERVATION, Seattle, 1974.

IBID, COASTAL ZONE MANAGEMENT STUDY OF INDIAN TRUST LANDS IN WESTERN WASHINGTON, Department of Ecology, Olympia, 1975.

Meyer, John H., A REVIEW OF THE LITURATURE ON THE VALUE OF ESTUARINE AND SHORELINE AREAS TO JUVENILE SALMONIDS IN PUGET SOUND WASHINGTON, U. S. Fish and Wildlife Service, Olympia, 1979.

OVERALL ECONOMIC DEVELOPMENT PLAN, THE TULALIP INDIAN RESERVATION, Tulalip Tribes, 1976.

Parametrix, Inc., WATER QUALITY AND NEARSHORE FISH INVESTIGATIONS IN TULALIP BAY, WASHINGTON, Bellevue, 1979.

Shapiro and Associates, Inc./Andrew L. Driscoll, Consultant, SNOHOMISH ESTUARY WETLANDS STUDY, SUMMARY REPORT, VOLUME 1, Corps of Engineers, Seattle, May 1979.

IBID, BASELINE INFORMATION AND EVALUATION, VOLUME II.

IBID, CLASSIFICATION AND MAPPING, VOLUME III

IBID, DELINEATION OF WETLAND BOUNDARIES, VOLUME IV.

Snohomish County Planning Department, OVERALL ECONOMIC DEVELOPMENT PLAN, Everett.

Snohomish County Planning Department, SNOHOMISH COUNTY SHORELINE MANAGEMENT MASTER PROGRAM, Everett, 1974.

Snohomish County Planning Department, SHORELINES OF SNOHOMISH COUNTY, INVENTORY SUMMARY, Everett, 1973.

Triad Associates, TULALIP RESERVATION ENVIRONMENTAL STUDY, Bellevue, 1977.

Triad Associates, TULALIP RESERVATION: PROPOSED ENVIRONMENTAL ORDINANCES, Bellevue, 1977.

TULALIP FISHERIES REPORT, The Tulalip Tribes, 1978.

APPENDIX D

PROPOSED AMENDMENT TO TULALIP ZONING ORDINANCE

In order to assure the protection of the coastal area resources through proper evaluation of project proposals, the following amendments to Ordinance 35 are recommended:

Section 1.0 PURPOSE

....as set forth in the Comprehensive Plan AND RELATED DOCUMENTS; to bring to.....

Section 2.0 DEFINITIONS

Add COASTAL AREA MANAGEMENT PLAN The Policies, guidelines and procedures adapted for the development and protection of the coastal area resources of the Reservation by the Board of Directors by its Resolution #_____ of____day of_____, 19_____, which by this reference is incorporated herein and made a part of this ordinance.

Add COASTAL MANAGEMENT AREA The area of the Reservation where development and other activities could significantly influence the coastal area resources of the Reservation as described and mapped in the Coastal Area Management Plan.

Add MAJOR ACTION OR PROJECT Any action or project within the Coastal Management Area which may have a measurable or significant influence on the coastal area resources. Major actions or projects will include any proposal which:

1. Requires the removal or emplacement of 500 cubic yards of material;
2. Any structure 2,000 square feet or larger at the perimeter;
3. Any action or project which would cause an increase of 3 cubic fee/second in the peak surface water runoff during a ten year storm over the runoff during natural conditions;

4. Any activity proposed which would occupy 20,000 square feet of land area or more;
5. Any action or project which would be likely in the worst case condition to cause a measurable adverse impact on the coastal area resource;
6. Any subdivision of more than four lots.

Section 4.1.3 (New Section) COASTAL MANAGEMENT AREA

4.1.3.1 Before the issuance of any approval or permit, the Hearing Examiner shall determine if the project or action proposed is within the Coastal Management Area. All projects within the Coastal Management Area will meet the guidelines and principles set forth in the Coastal Area Management Plan.

4.1.3.2 The Hearing Examiner shall determin if the proposed action or project is a major action or project. This determination will be made on the basis of the project information submitted to the Hearing Examiner, investigation of the site of the proposed action or project, and consultation with other persons and agencies with expertise in the coastal area resources and resource development.

4.1.3.3 All major projects or actions will be evaluated in accordance with the procedure prescribed in the Coastal Area Management Plan.

4.1.3.4 On any project within the Coastal Management Area, the Hearing Examiner may establish any reasonable conditions to any permit or approval which he deems necessary for the protection of the coastal area resources and achievement of the Coastal Management Plan Goals and Objectives. If there are no conditions which could be applied to the project or action which would satisfy the Goals and Objectives of the Coastal Area Management Plan, the Hearing Examiner may withhold approval and deny any required permit.

Section 4.1.4 (Strike)

Section 4.7 USE AND OCCUPANCY PERMIT

...with the procedures specified in Section 5. All projects within the Coastal Management Area will be additionally subject to the procedures specified in Section 4.1.3 and found to be in compliance with the Coastal Area Management Plan.

Section 5.4 FEES

add 5.4.7 The costs of evaluating and administering any proposal regulated by this ordinance shall be borne by the applicant. Such costs shall include: Hearing Examiner fees, fees of technical specialists, administrative overhead and direct expenses necessary for complete evaluation of the proposal.

APPENDIX A

SUMMARY OF WETLAND AND AQUATIC HABITAT TYPES FOUND IN THE TULALIP COASTAL ZONE

Extracted from: U.S. Army Corps of Engineers
Snohomish Estuary Wetlands Study
(Burrell, 1978)

Wetland and Aquatic Habitat Types on the Tulalip Reservation

5 Water

Both marine and freshwater habitats are considered in those classifications in which water is the principal medium.

Description: This habitat type includes a wide variety of water bodies within the study area. The estuarine river channels and small streams, inland ponds and lakes, and the open waters of Possession Sound are part of this habitat type. Salinity varies from the marine waters of Possession Sound to freshwater lakes and streams. Water is the medium which transports detritus from wetland and upland habitat types to intertidal and subtidal areas. Phytoplankton are the primary producers of the water habitat, and the basis of a grazing food web which includes zooplankton, crabs, salmon and other aquatic fauna.

Significant Relationships: Water is not only the habitat for fish, shellfish, and plankton, it also provides resting and feeding habitat for waterfowl, wading birds and a few upland mammals such as beaver, muskrat and otter. Water is the transport medium of detritus, carrying it from the wetland habitat types to the intertidal flats and beyond.

Water is also used to dilute and dissipate municipal and industrial wastes. Materials which are discharged into the estuary are meant to be transported out of the river and into Possession Sound.

51 River/Stream

Running water habitats are distinguished by a definite current which varies greatly with valley shape and other geo-hydraulic features in different streams and in different segments of the same stream course.

Streams and creeks are the backbone of the Tulalip Reservation

drainage system. They allow the movement of nutrients into the estuary and bay from farther upstream, with which, the productivity of the system would drastically decrease. It is critical habitat for benthic invertebrates, anadromous fishes, Ospreys, Great Blue Herons, Double-crested Cormorants, Belted Kingfishers, waterfowl, grebes, swallows, gulls, riber otters, mink, beaver, muskrats, raccoons and harbor seals. Decline in water quality and alteration to creeks and streams will result in decreased productivity and numbers of animal and fish species.

511 Estuarine Zone

Strongly influenced by the marine environment and can be distinguished by a branching channel pattern in a broad, flat valley. The stream channel gradient is near 0 feet per mile with the result that weak currents deposit silt and mud in the stream bed.

515 Intermittent Stream

Streams which lack a sufficient watershed to sustain year-round flow and are thus distinguished from other flowing waters. Although abbreviated, zonation does occur along the stream course and resultant geo-hydraulic features will be similar to larger streams.

52 Lake/Pond

Permanent standing water habitats are numerous in the recently glaciated Pacific Northwest. They occur in local depressions of varying depth and may or may not contain emergent vegetation. They are important habitats for waterfowl, shorebirds, aquatic mammals, amphibians, fish and species which are associated with marshes, swamps and riparian vegetation. Loss of these habitats would be detrimental to almost all species of animals found in the Snohomish River Basin. For this reason, they are some of the most critical habitats found in the study area. (A list of animals seen in this type is given in Table B-1.)

521 Lake

For mapping purposes, those with a surface area greater than 20

acres. Open water areas are relatively large compared to near-shore zones and are usually the primary producing regions for the lake.

522 Inland Pond

Standing water with a surface area less than 20 acres situated at higher elevations than the beach fringe or river delta. Ponds are typically shallow; therefore, the nearshore zone is an important primary producing area.

524 Beaver Pond

Standing water formed along small streams by the damming activities of beavers.

526 Fish Rearing Facility

Rearing ponds for juvenile salmon.

54 Bay/Estuary

This category includes moderately protected marine embayments commonly referred to as bays, harbors, inlets and coves. They have free connections with the open sea; wind and wave action is modified by protective uplands, and freshwater inflow creates variable salinities. Bluffs, beach substrates, marshes, eelgrass beds and other intertidal habitats associated with these embayments are greatly affected by upland, freshwater and marine influences and should be viewed as integrated communities, not as individual habitat types.

Bays and estuaries are dynamic natural systems. Important aspects of these systems are their high productivity and the extremely diverse life forms they support. The delicate balance and operations of these areas is dependent on the interrelationships of complex natural processes that go on not only in the ocean and rivers but on land and in the atmosphere as well. Bays and estuaries are fragile environments, and seemingly modest alterations in the processes that govern them can cause major changes in the biota which they support.

55 Impoundment

Those portions of both marine and freshwater habitats isolated from marine waters by man-made obstructions.

59 Open Water

Those marine waters commonly referred to as Sounds, Straights and Reaches other than bays and estuaries. The open salt water of Puget Sound is contiguous with the western shore of the Reservation.

6 Aquatic Lands

Designates those lands which are either covered by water or strongly influenced by adjacent waters (Fig. B-1).

61 Aquatic Land-Forested

Areas that have surface or standing water during some portion of the year and are at least partially forested.

611 Intertidal Freshwater/Brackish Swamp

This is a shrubby or forested area in which the tidal influctuation results in inundation and/or water table fluctuation. Although the frequency and duration of tidal inundation are not known, the boggy soil and fluctuating water level in shallow depressions are strong evidence of tidal influence. The vegetation in these areas is of three major types: Coniferous trees, broadleaf deciduous trees, and shrubs. The coniferous trees are predominantly Sitka Spruce. Broadleaf deciduous trees found in the swamp include alder and several species of willow. Wild rose, Nootka rose, honeysuckle, Ninebark and Spiraea are the most common shrubs found in the swamp habitat. Cattail and Goldenrod may also be associated with swamp habitats.

6111 With Picea

This habitat class is defined by the presence of Sitka Spruce.

Distribution: There are parcels of intertidal spruce swamp at Quilceda Creek.

Significant Relationships: The swamp habitat type supports a wide variety of fauna. Insects are abundant in the boggy, densely vegetated community. These insects are an important food source to small songbirds such as wrens and chicadees. Insects are also an important food source to woodpeckers, which depend on snags for feeding grounds. A wide variety of small rodents, such as mice and moles, are common on the ground and in the low branches of swamps. These small mammals and birds are preyed on by larger mammals such as muskrat, mink and raccoon. These larger mammals often next in dens or hollow logs within the swamp. Deer may also browse in swamps, especially forested swamps with a somewhat less dense understory. Raptors often next in coniferous trees and also rest there when not hunting.

The swamp habitat type is highly productive, generating abundant detritus. However, since the swamp has a relatively high tidal elevation, much of this detritus is deposited as forest litter, rather than being exported into the aquatic ecosystem. As a habitat for a wide variety of birds and mammals the swamp is an important part of the food web which constitutes the estuarine ecosystem.

62 Aquatic Land-Vegetated Nonforested

That portion of the wetlands which is non-forested but may be densely vegetated, e.g., marshes, bogs, meadows, and intertidal areas.

Estuaries rank along with rain forests and coral reefs as some of the most productive ecosystems known to man. The major contributors of the primary productivity within the estuarine system are marine plant communities (ie kelps, eelgrass, other algal associations and salt marshes). Thus, they are also the major contributors of organic matter in estuaries. There are two ways in which this organic matter is used by animals. Plants are either grazed directly by herivores, or second, the organic matter is used by detritus feeders which eat dead or decaying plant material. These plants are also important to animals as a substrate to live on and as cover for refuge from predators. A specific example of their use

is eelgrass which is used as a substrate, as direct food for a small number of herbivorous species, as food for detritivores, as a stabilizer for a mud substrate, and as cover for organisms requiring quiet or silt-free water. (Phillips 1974).

Marine plant communities form the basis for some of the most complex food webs known to man. Because of their complexity any destruction of these plant communities will negatively effect the biota of the entire estuary.

Like marine plant communities, freshwater marshes also tend to be naturally fertile systems (Odum, 1971). Due to the lack of tidal action and flowing water, they affect a smaller area than marine plant communities and thus, support less complex food chains. However, they are used by a large number of wildlife species (i.e. beaver, muskrat, otter, coyotes, raptors, waterfowl, song birds, Great Blue Herons, fish, benthic invertebrates and amphibians). Some of these species live almost exclusively in marshes, while others are dependent on marshes to some degree.

One of the most valuable uses of marshes is their ability to moderate extreme highs and lows in stream flow.

621 Nereocystis Communities

The kelps (Nereocystis spp.) are a group consisting of large brown algae which are often a conspicuous component of the shoreline.

Kelp is found where rock, cobble, or coarse gravel substrates are present; and exists in both the lower intertidal and shallow subtidal regions.

623 Eelgrass

Eelgrass is a rooted plant found in the lower intertidal and shallow subtidal zones of marine habitats. It often forms large dense beds on muddy sand flats. The abundant rhizomes and roots of eelgrass often form thick mats which resist erosion, thus stabilizing the substrate.

Distribution: Extensive eelgrass beds are found on the shallow mudflats at the mouth of the Snohomish River. These flats extend westward to Tulalip Bay and south to the south end of Jetty Island. More than 40% of the 3,000+ acres of flats in this area are vegetated with eelgrass. In addition, there are eelgrass beds in Tulalip Bay, although they are not extensive.

Significant Relationships: Eelgrass provides food, shelter, and substrate for a diverse population of organisms. Numerous species of algae, bacteria, and invertebrates reside on eelgrass blades. Many of these in turn are food for the fish and crabs which inhabit the beds. The dense vegetation and thick root mass provide shelter for fish, crabs and benthic organisms. All of these in turn are food for a diversity of larger fish, waterfowl and occasional raptors. Shellfish, including cockles and some clams, are found in eelgrass beds. Detrital material, the remains of dead plants such as eelgrass, are known to be food for a variety of filter feeding organisms, including many which are residents of unvegetated flats. Eelgrass beds are also important spawning and rearing grounds for herring.

622 Other Algal Associations

Algal communities in intertidal areas are composed of green, brown and red algal types. Certain types may be separated on the basis of substrate types and tidal levels.

6221 Ulvoids

Green algae occurring mainly in the low to mid tide range in large mats. Characteristically occurs in spring and in sheltered areas during the summer.

624 Salt Marsh

Description: These are communities of intertidal vascular plants which are capable of withstanding daily inundation with marine waters. The frequency and duration of inundation are a function of elevation and the various communities tend to segregate according to elevation. Thus, there is a plant community zonation within the marsh with respect to elevation.

Distribution: Salt marsh areas are located on North Ebey Island, west and south of the landfill and at Tulalip Bay. There are 145 acres of salt marsh between Priest Point and I-5, with 90% in the Quilceda Creek area.

Salt marshes provide a feeding habitat for a variety of birds and mammals. Seeds of marsh plants (e.g. sedge) are a food source to waterfowl, especially dabbling ducks. Songbirds such as sparrows, and small mammals also feed on marsh plants when the tide is low. Insectivorous birds such as swallows, wrens and tits are often observed to feed on the numerous insects associated with marsh habitats. These small birds and mammals in turn provide prey for the raptors (especially hawks) and carnivorous mammals (mink, raccoon, muskrat) which often enter marsh areas.

In addition to feeding, numerous birds use the marsh for nesting and resting. Some waterfowl may next in the salt marsh, and many take shelter there during moulting. Rails, bitterns and some wrens breed in the high marsh; they build their nests above the high water mark or hang them from the vegetation.

Salt marshes are highly productive habitat types which, due to frequent tidal inundation, export much of that productivity as detritus into the aquatic system. This detrital material in turn is a major food source for the abundant detritovores that occupy nearby mudflats.

6241 Carex

A plant community in salt marsh dominated by Lyngby's sedge. This community occurs primarily along the edges of Ebey and Steamboat Sloughs.

6242 Triglochin - Carex

A plant community where seaside arrowgrass (Triglochin maritimum) and Lyngby's sedge are dominant.

6243 Carex - Potentilla - Agrostis - Triglochin - Deschampsia

A plant community where Lyngby's sedge, Pacific silverweed, bentgrass, seaside arrowgrass and tufted hairgrass are dominant.

6244 Juncus - Potentilla - Agrostis - Triglochin - Deschampsia

A plant community where Baltic rush, Pacific silverweed, bentgrass, seaside arrowgrass and tufted hairgrass are dominant.

6245 Disturbed Carex

Continual disturbance by drift logs, not by other types of disturbance, create this diverse salt marsh community. Common plants in this type are Lyngby's sedge, Pacific silverweed, common silverweed, Douglas aster, common orache, tufted hairgrass, bentgrass, meadow barley, bulruch, common cattail, seaside arrowgrass and meadow goldenrod.

6247 Salicornia

A slat marsh characterized by the presence of pickleweed. Pickleweed was found only on shoreline of Tulalip Bay.

625 Brackfish/Freshwater Intertidal Marsh

These are vegetated intertidal areas which receive regular brackfish or freshwater inundation. Almost 90% of this habitat type is represented by a mixed cattail/bulrush community (6252 habitat type).

120 acres are scattered as small parcels west of I-5 on Ebey Island. There are about 105 acres of this habitat type in the Quilceda Creek area, with about 95% east of the creek.

The sedge marsh is an important feeding habitat for waterfowl; the seeds are eaten by numerous dabbling ducks. Its low elevation along the slough makes it a popular feeding area which is easily reached from the water at most stages of the tide.

Cattails and bulrushes are an important feeding and breeding habitat for a wide variety of fauna in the estuary. Many small rodents next on the floor of the marsh and feed on insects, seeds and vegetation. Small songbirds also feed on insects; their nests are often attached to a clump of reeds. Rails and bitterns are also common residents in this habitat type, although due to their shy manner they are rarely seen. Larger rodents, such as beaver and muskrat, also feed in these marshes (the only known beaver dam in the estuary is in a cattail marsh near Lowell). Evidence of deer has been seen near

marsh-swamp borders, indicating use of the habitat as a resting area. With the abundance of small mammals and birds, numerous predators find the marsh an important feeding ground. Raptors, mink, and raccoons all enter the marsh to hunt.

The low diversity brackish marshes have an extremely high rate of productivity. In addition, the relatively low tidal elevation and comsequently high aquatic interaction means a significant percentage of this material is exported as detritus, adding to the food base of an important aquatic food web. These marshes also aid in the regulation of nutrients and contaminants in the estuary through the deposition of suspended solids. Nutrients, such as phosphorous and nitrogen, and assorted contaminants which adhere onto these suspended solids before deposition, are absorbed by the vegetation, trapped in the sediment or slowly broken down by microbial action.

6250 Other

A brackish/freshwater intertidal marsh type which does not fit into the other categories.

6252 Scirpus - Typha

Marshes where bulrushes and common cattail have almost equal densities. Few other plants occur in this type.

63 Aquatic Land-Nonvegetated

Substrates which are important habitats for many benthic invertebrates.

Beach substrates are important biologically for the diverse benthic invertebrate community they support. These invertebrates are important sources of food for diving ducks, shorebirds, fish and man.

637 Muddy-sand Substrates

Fine sand and silt form a characteristic habitat in protected areas such as bays and estuaries. Contains a more diverse and abundant biological community than either a sand or mud habitat.

635 Mud Substrate

Made up of very fine particles. As a result, this substrate is extremely soft and sometimes dangerous to walk in. Mud occurs only in areas where wave action and currents are extremely low, such as at the heads of bays and estuaries. Due to this location, mud is often associated with brackish waters.

Description: These two unvegetated substrates are found throughout much of the flats which extend from the Snohomish River mouth to Tulalip Bay. The substrate is mud or a silt and sand mixture which contains an abundant biological community, including benthic diatoms.

Distribution: In addition to the flats extending into Port Gardner, mud and silty sand substrates are found through much of Tulalip Bay. Small parcels of this habitat type have been identified along Quilceda Creek and in the area between the landfill and the railroad tracks on North Ebey Island.

Although the distribution of these flats has not been recorded historically, they have probably been accreting westward for centuries. River-borne sediments and materials eroded from both the Everett and Mission Beach Bluffs have been deposited in this area, slowly extending the flats outward from the estuary.

The major impacts on these unvegetated flats have been filling and log rafting. Filling raises the substrate surface out of the marine environment, thus eliminating it from direct interaction and making it available for development. This has occurred in several locations. Log storage resitrcts access by waterfowl which would use the shallow flats for feeding. It also results in the deposition of large quantities of bark and wood chips. This material generates a significant biochemical oxygen demand and eliminates much of the potential habitat value for benthic organisms. Additionally, log rafting shades the substrate, thus potentially impacting benthic diatoms. The shallow flats in much of Tulalip Bay have traditionally been used for log storage activities.

Significant Relationships: Mud and sand flats in the Snohomish River mouth have been shown to be highly productive habitats for

benthic invertebrates and plankton (Smith, 1977). These bottom dwelling organisms feed on detritus washed out of marshes and eelgrass beds, and on each other. They in turn provide food for waterfowl and a variety of fish, such as salmon and flatfish. Shallow sand and mud flats have been noted as having some of the highest fish densities of all nearshore fish habitats (Miller, et al, 1976). In part this high density results from use of the areas by schooling juvenile salmon, herring and smelt. This activity makes these shallows extremely important to the later commercial and sport harvest of these species.

In addition to fish, invertebrates and waterfowl, mud and sand flats are important habitats for shellfish. Bent-nosed clams, soft-shell clams, horse mussel, cockles and littleneck clams are all commonly associated with these habitats.

7 Other Lands

Lands not identified in the rest of the classification system.

71 Spits

Shoreforms created when sand and other fine sediments eroded from cliffs or bluffs are carried by alongshore draft and deposited at bay mouths or coastal obstructions. Marsh and beach grassland vegetation typically invade the uppoer portions of these important resting areas for gulls and shorebirds.

The only spit in the study area is located in Tulalip Bay. Spits have significant value as resting sites for large numbers of animals, particularly birds. Their isolation and unobstructed view make them especially important for safety and freedom from disturbance. Numerous shorebirds, gulls, terns, waterfowl and harbor seals frequently can be observed on undisturbed portions of spits.

711 Vegetated Spit

If the vegetated area of a spit is less than can be mapped at scale, the entire spit is designated a vegetated spit.