

WHIDBEY-CAMANO BASIN

Water Resource Inventory Area 06

The Whidbey-Camano Island area contains many small intermittent streams that handle the surface run-off from the occasionally cleared and sometimes moderately timbered slopes of Whidbey Island and Camano Island. Most of these streams are dry during the summer months and, consequently, are of limited value to fish production. A few streams, however, provide adequate flows during specific spawning and rearing periods for some species with a few maintaining some flow throughout the year. Streams capable of maintaining at least limited anadromous fish populations include one moderate sized, unnamed stream (Maxwelton Creek), three smaller unnamed drainages on Whidbey Island, and three unnamed drainages on Camano Island. These drainages provide suitable spawning and rearing area for anadromous fish and each makes some contribution to the specific ecological character of the estuarine and marine environment in the vicinity of its confluence with salt water. Seventy-six independent streams and tributaries are identified in this basin providing over 87 lineal miles of drainage.



PHOTO 06-1. Possession Head on the southern tip of Whidbey Island is a popular sport fishing area.

Within the basin boundaries, the island areas present more than 220 miles of open beach and protected bays. These areas afford suitable estuary and marine habitats that are extensively utilized by anadromous fish.



PHOTO 06-2. Small short-run streams are typical of those on Whidbey and Camano islands.

Fish Inventory and Distribution

Two Pacific salmon species, coho and chum, utilize the suitable drainages within the Island basin. These few streams contain approximately seven miles of accessible area to anadromous fish. For the salmon, accessibility to potential spawning grounds is usually restricted to the high water periods occurring in the late fall and early winter seasons.

Coho Salmon — Streams on Whidbey Island offering coho salmon potential include one moderate sized, unnamed stream (Maxwelton Creek) and at least three smaller drainages. On Camano Island at least one of the small unnamed streams receives coho. These fish enter these streams in late

Timing of salmon fresh-water life phases, Whidbey-Camano Islands WRIA 06

Species	Fresh-water Life Phase	Month												
		J	F	M	A	M	J	J	A	S	O	N	D	
Coho	Upstream migration													
	Spawning	■												■
	Intragravel develop.	■	■	■	■	■								■
	Juvenile rearing	■	■	■	■	■	■	■	■	■	■	■	■	■
	Juv. out migration		■	■	■	■	■							
Chum	Upstream migration													
	Spawning	■												■
	Intragravel develop.	■	■	■	■	■								■
	Juvenile rearing		■	■	■	■	■	■	■	■	■	■	■	■
	Juv. out migration		■	■	■	■	■							

November and December and utilize intermittent sections throughout the entire accessible length for spawning. Following emergence from the gravel, the juvenile coho generally remain in the stream for more than one year before migrating to sea. Based on spot checks during coho spawning and calculated rearing capacities of streams, it is estimated that an average run of approximately 100 coho salmon spawn in the island's drainages each year.

Chum Salmon — Adult chum salmon utilize the same streams inhabited by coho. These fish enter the streams in December and also utilize intermittent sections throughout most of the accessible length of each water course. Soon after the emergence, the juvenile chum begin seaward migration, completing their early fresh water life phase in late April or May.

Salmon Production

The numbers of salmon produced from the Island's natural drainages are probably too small to make a significant contribution to commercial or sport fisheries of the area, even though these fisheries are extensive throughout the adjacent marine waters.

Due to lack of a sufficient water supply, hatchery type operations within the Island basin are not feasible. From 1961 to 1966 three fish farms composed of brackish water lagoons were operated on Whidbey Island. These included Crockett Lake and Maylor and Kennedy's lagoons. Chinook, coho, and chum fry were reared in these lagoons annually and released into the marine waters.

These stocks of salmon were received from hatcheries outside this basin. For the period 1961 through 1966, a total of 4,036, 716 fall chinook, 608,739 coho, 888,606 chum, and 7,397 sockeye were planted into these waters. The fish were introduced into these natural environments as fry and released when smoltified. The average annual contributions to the various ocean and Washington fisheries were estimated at 1,300 chinook, 100 chum, and 6,700 coho from this program.

The operation of these fish farms ceased in 1967 since they proved to be economically infeasible in comparison to other methods of artificial production.

Harvest

Due to limited natural production, few salmon originating from the Island basin contribute to commercial or sport harvest. Extensive salmon harvests do occur within these marine waters. The Island basin's strategic location at the junction to Puget Sound and in front of nearly every major fish producing stream within the region, makes this basin one of the most important and critical harvest areas for both commercial and sport fisheries. This is particularly true for salmon stocks from inner Puget Sound rivers as the entire runs must pass through these waters on their migration route to home streams.

A very intense commercial fishery for salmon operates within these marine waters. In the Whidbey area, the most productive commercial net fisheries exist off West Beach, Lagoon Point, Bush Point, Double Bluff, Indian Point, the west side of Possession Sound, Camano Head, and the southern half of Skagit Bay. Salmon caught within the basin are landed at all major ports within Puget Sound.



PHOTO 06-3. A purse seiner completing a set off the west shore of Whidbey Island.

The salt water fisheries of the Whidbey-Camano area contribute significantly to the overall economy of the basin and Puget Sound. Recreation and tourism are two of the more important industries and much of their success can be attributed to the occurrence of abundant salmon migrations through these waters.



PHOTO 06-4. Anglers fishing the popular Whidbey-Camano marine waters harvest salmon that originate from other Puget Sound rivers.

Salmon sport fishing within these marine waters is also very intense as indicated by the more than 272,000 angler trips logged in the vicinity in 1970. The abundance and availability of salmon throughout the year in the semi-protected waters accounts for this heavy fishery. Salmon fishing coupled with the scenic splendor of the islands and waterways serves as the principle attraction. Favorite sport angling sites in the Whidbey area include West Beach, Hope Island, Deception Pass, Possession Point, and virtually all of Admiralty Inlet, Holmes Harbor, Camano Head, Port Susan, and all of Saratoga Passage.

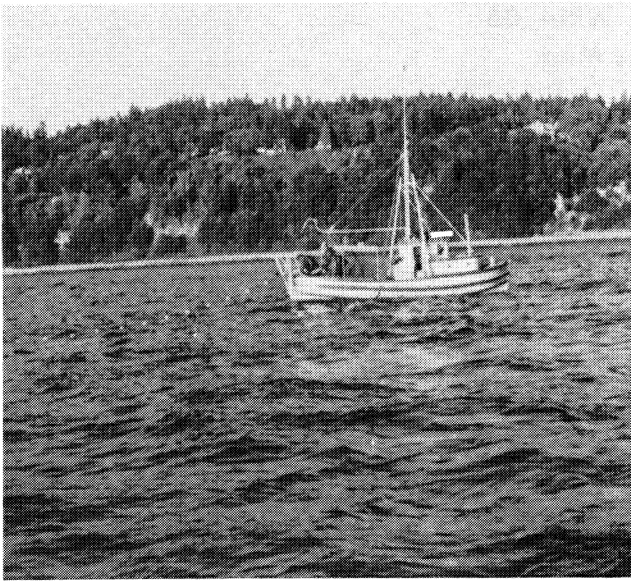


PHOTO 06-5. Gillnetters harvest large numbers of salmon in the marine waters of this basin.

Limiting Factors

Limiting factors refer to conditions that lead to a complete loss or a reduction of an environment's fish producing potential, excluding harvest. Since the stream reaches of the Whidbey-Camano basin hold relatively limited value for production of anadromous fish, most of the consideration of limiting factors within the area must be focused on the more important fish producing environments.

Stream flows — Within the limited stream reaches of the Whidbey-Camano basin the principal factor restricting both anadromous and resident fish populations is the lack of substantial water. The majority of these streams go dry during the summer months. Fish populations in streams maintaining a year-round flow suffer extensively from reduced flows. This condition causes a loss in total available rearing area and limits the production capacity of the streams. In addition, many of the islands' more permanent streams offer shallow gradients and slow moving water courses which may, during warm periods, present unsuitable temperatures and reduced oxygen conditions.

Physical barriers — Few physical barriers exist in this basin because of the generally flat gradients and short stream lengths encountered. There are occasional debris blockages created by seasonal high water, but the most serious problems associated with adult transportation occur due to low flows.

Water quality — At present, water quality problems are generally associated with low flows when high temperatures and low oxygen levels limit fish usage. As more land development occurs on the islands, domestic water use and waste disposal will present further burdens on the already limited water resources of the area.

Limited spawning and rearing — Many of the intermittent flowing streams hold limited spawning potential as these areas are utilized principally by anadromous species not requiring extended rearing periods. However, most of these streams exhibit seasonal flows too low for access by adult spawners.

Watershed development — Recreational land development is the major human impact on this basin. As more homes are built, the requirements for water will tax the limited supply on hand and further reduce the water table. This could cause streams that now flow the year-round to go dry during the summer months. Sewage disposal and urban runoff from streets and roofs will also impact the watershed by introducing these substances into nearby streams. The Whidbey Island Naval Air Station is an example of extensive paved areas that increase surface runoff, siltation, and the introduction of toxic chemicals into the basin's streams.

**ISLAND BASIN WRIA 06
Index to Key Map**

Map Title	Stream Numbers	Page
WHIDBEY-CAMANO ISLANDS (Independent Drain)	(06.0001—06.0076)	Island— 102

WHIDBEY BASIN WRIA - 06

122° 00'
48° 30'

122° 45'

122° 15'
48° 30'

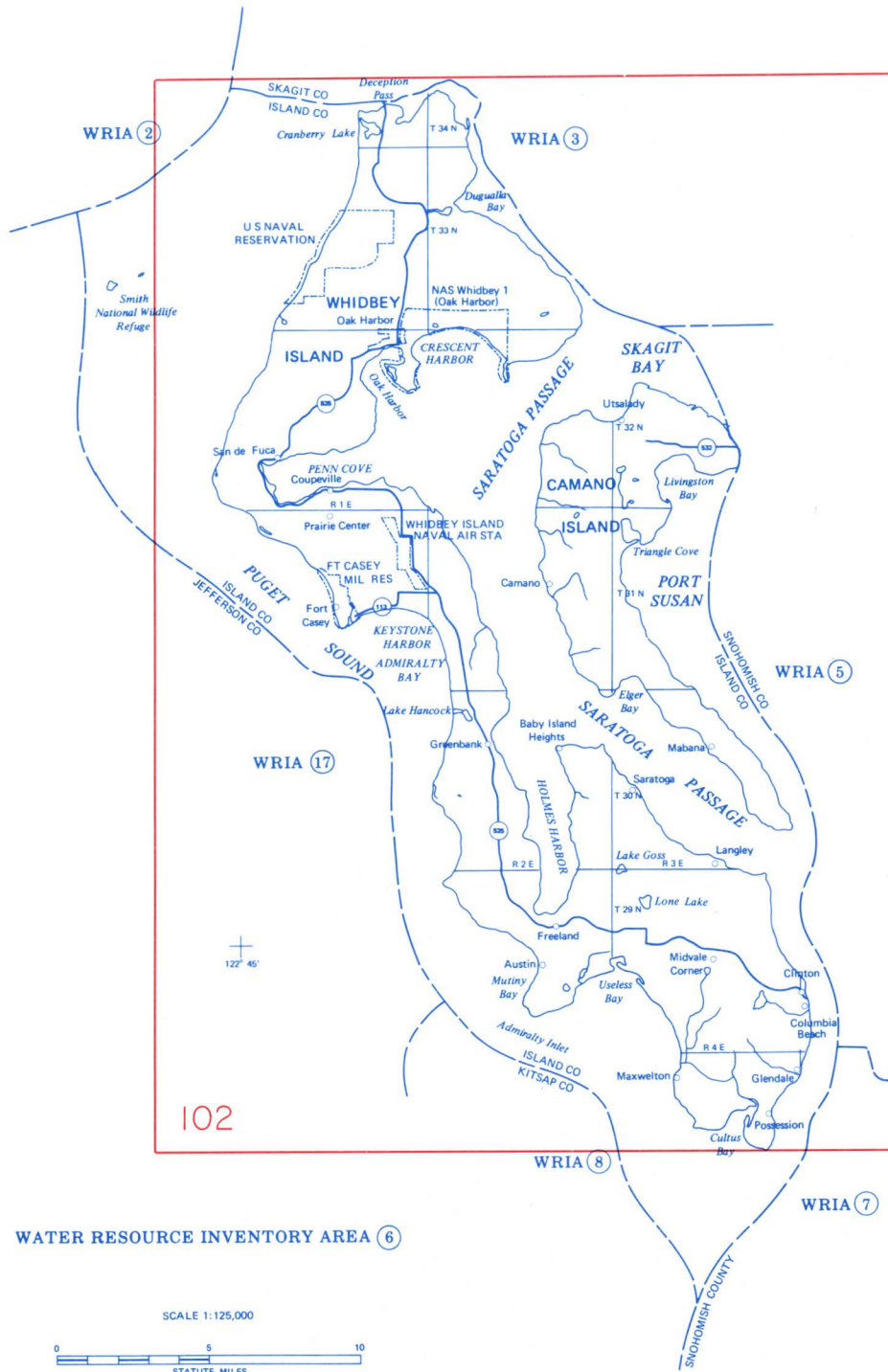
48° 15'

48° 15'

48° 00'
122° 00'

122° 45'

48° 00'
122° 15'



WHIDBEY-CAMANO ISLANDS

Independent Drainages

This section covers Whidbey and Camano Island streams. Whidbey Island access is via Highway 525 out of Anacortes at its northern tip, and by the Mukilteo-Columbia Beach ferry near the southern end. Camano is reached via Highway 532 west of Stanwood. Together the islands contain nearly 50 independent streams, and with their tributaries provide almost 90 total stream miles.

Stream Description

Of the island's total drainages only about 7 offer gradient or flow conditions suitable for any salmon production. The remaining streams either present steep gradients as they enter salt water or have intermittent flow patterns generally unsuitable for salmon use.

Whidbey's largest unnamed tributary (0029) drains south from Miller Lake vicinity, entering Admiralty Inlet near the community of Maxwelton on the island's southwest shoreline. It is 4 miles in length, with 3.5 miles of tributaries. Surrounding land is developed mostly to small farms, with numerous cleared areas having low stream-side growth and some light timber along the lower 1.5 miles. A considerable portion has been channelized, with the stream flowing over moderate to gentle gradient along its length. The stream contains relatively shallow, slow-moving glides with some fairly good pool-riffle stretches. Its bottom is mostly larger gravel and sand with a few areas containing slightly larger material.

Three other small unnamed streams on Whidbey Island hold at least some potential for salmon production. One (0037) drains south from the Lone Lake vicinity for about 4 miles, entering Useless Bay via Deer Lagoon on the southwest end of the island. The second stream (0055) enters salt water on the island's northwest side. The third (0010) enters the southern end of Holmes Harbor near Freeland. Each of these small streams provide shallow gradient conditions over most of their length. Their narrow channels produce a few relatively good pool-riffle stretches but mostly slow-moving slides. The bottoms are mainly of sand or small patch gravel stretches. During summer months at least portions of these streams go dry.

Camano Island has 3 streams holding at least some limited salmon production potential. As on Whidbey, these are primarily very small streams having surrounding land developed mostly to small farms, with some scattered residences, considerable cleared area, and occasional dense deciduous trees and thickets. One of these streams (0070) enters Saratoga Pass on the island's west side at the community of Camano; another (0071) enters near Madrona Beach; and the third (0063) located on the island's east side enters Triangle Cove. Each of these streams exhibits mostly gentle gradient over much of their accessible stream length. They contain a few good pool-riffle stretches, with mostly shallow, slow-moving glides, and their bottoms are predominantly of small gravel and sand.

The major developments in Island County have been near the towns of Oak Harbor and Coupeville on Whidbey Island. Ault Field, a U.S. Naval air station, is located on the north end, near Oak Harbor. Other rapidly growing communities are Clinton, Freeland, and Harbor Center. Utsalady is

the largest settlement on Camano Island. Numerous smaller settlements dot both islands, and recreational developments and residences line most suitable shallow-bank beaches. Other land usage includes second growth timber and farming of fertile agricultural land.

Salmon Utilization

There is little information available regarding actual salmon utilization of streams within this area. Both coho and chum salmon have been reported in Whidbey's larger unnamed stream (Maxwelton Creek). Production potential appears better for chum salmon since these fish leave the streams early in their life, and do not require summertime rearing habitat as do coho. The surrounding marine waters, and particularly the shoreline zones, are utilized by large concentrations of juvenile salmon originating from other production areas.

Limiting Factors

The lack of accessible streams, or of streams maintaining adequate flow, is the principal factor limiting salmon production. Any future water demands would further restrict use of most island drainages.

Beneficial Developments

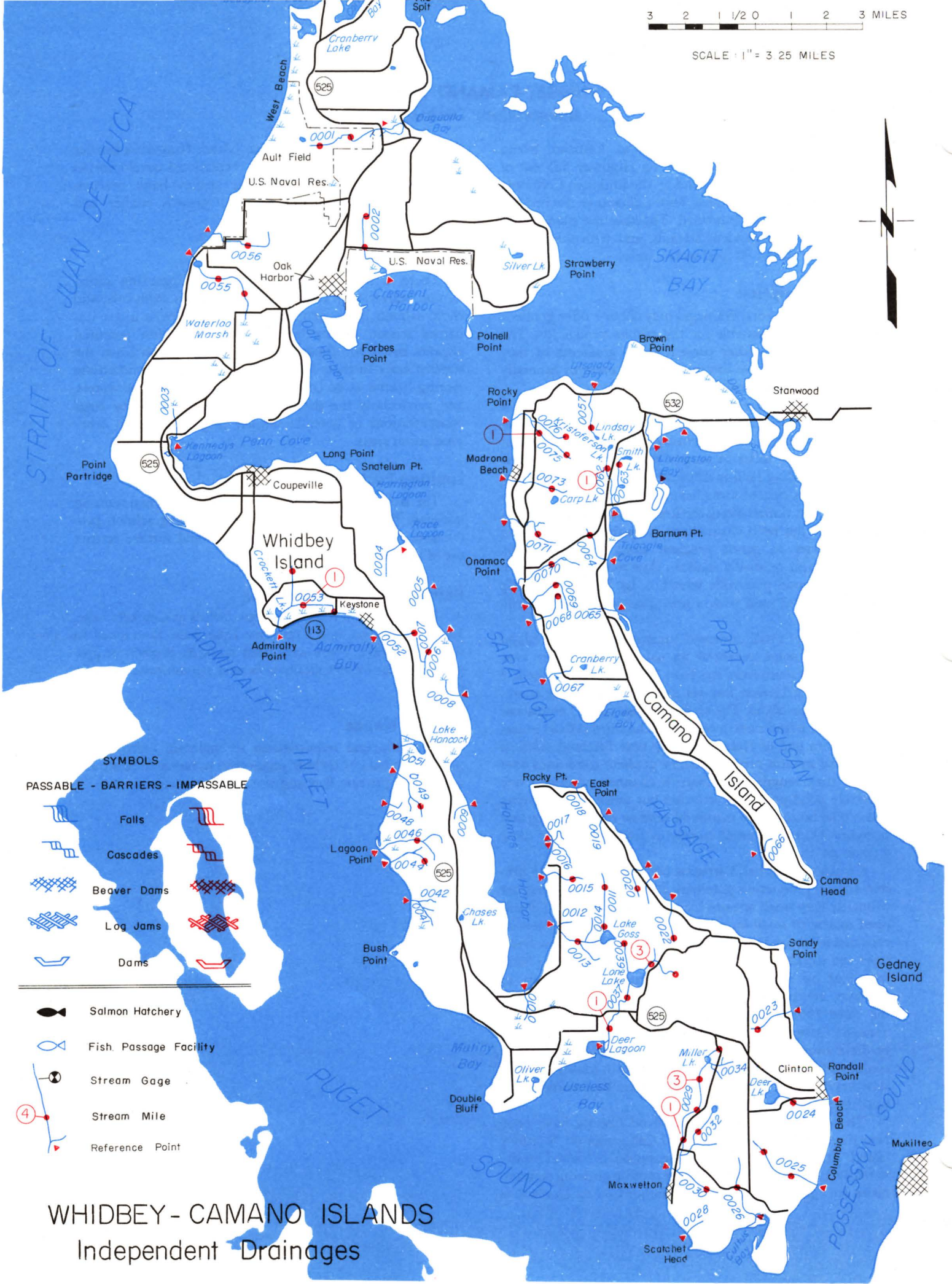
Former salmon rearing impoundments at Crockett Lake, Kennedy Lagoon, and Cranberry Lake were abandoned in the early 1960's. There have been no other projects or programs conducted specifically to benefit salmon production in the area.

Habitat Needs

The principal requirements to maintain existing fish production habitat include preserving stream-side cover and maintaining stream flow and streambed conditions.

3 2 1 1/2 0 1 2 3 MILES

SCALE: 1" = 3.25 MILES



- SYMBOLS**
- PASSABLE - BARRIERS - IMPASSABLE
- Falls
 - Cascades
 - Beaver Dams
 - Log Jams
 - Dams
 - Dams
 - Salmon Hatchery
 - Fish Passage Facility
 - Stream Gage
 - Stream Mile
 - Reference Point

WHIDBEY - CAMANO ISLANDS Independent Drainages

WHIDBEY-CAMANO ISLANDS — INDEPENDENT DRAINAGES

Islands Basin — WRIA 06

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
	WHIDBEY ISLAND ¹				
0001	Unnamed	Sec18,T33N,R2E	2.4	—	Unknown
0002	Unnamed	Sec31,T32N,R2E	2.5	—	Unknown
	Unnamed Pond	Outlet-0.05	—	—	
0006	Unnamed	Sec20,T31N,R2E	1.7	—	Unknown
0011	Unnamed	Sec35,T30N,R2E	3.4	—	Unknown
	Lake Goss	Outlet-1.5	—	—	
0015	Unnamed	Sec26,T30N,R2E	1.3	—	Unknown
0020	Unnamed	Sec29,T30N,R3E	1.1	—	None
0022	Unnamed	Sec32,T30N,R3E	1.1	—	Unknown
0023	Unnamed	Sec12,T29N,R3E	1.1	—	Unknown
0024	Unnamed	Sec30,T29N,R4E	1.6	—	Unknown
	Unnamed Reservoir	Outlet-0.51	—	—	
	Deer Lake	Outlet-1.6	—	—	
0025	Unnamed	Sec1,T28N,R3E	2.4	—	Unknown
0026	Unnamed	Sec11,T28N,R3E	1.9	—	Unknown
0029	Unnamed	Sec4,T28N,R3E	4.05	—	(Coho), (Chum)
0030	Unnamed	LB-0.1	1.35	—	Unknown
0032	Unnamed	LB-0.55	1.9	—	(Coho), (Chum)
	Unnamed Lake	Outlet-1.9	—	—	
	Miller Lake	Outlet-3.45	—	—	
0037	Unnamed	Sec19,T29N,R3E	4.1	—	Unknown
	Lone Lake	Outlet-2.4	—	—	
0039	Unnamed	RB-2.55	1.0	—	Unknown
0044	Unnamed	Sec30,T30N,R2E	1.15	—	None
0046	Unnamed	Sec19,T30N,R2E	1.8	—	Unknown
0049	Unnamed	Sec7,T30N,R2E	1.3	—	None
0052	Unnamed	Sec19,T31N,R2E	1.0	—	None
0053	Unnimed	Sec22,T31N,R1E	2.4	—	Unknown
	Crockett Lake	Outlet-0.3	—	—	
0054	Unnamed	RB-0.75	1.2	—	Unknown
0055	Unnamed	Sec32,T33N,R1E	2.8	—	Unknown
	Unnamed Lake	Outlet-0.2	—	—	
0056	Unnamed	Sec29,T33N,R1E	1.9	—	Unknown

¹ Tributaries listed from northern-most point in clockwise order around the islands.

WHIDBEY-CAMANO ISLANDS — INDEPENDENT DRAINAGES
Islands Basin — WRIA 06

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
	CAMANO ISLAND ²				
0057	Unnamed	Sec24,T32N,R2E	1.2	—	Unknown
	Lindsay Lake	Outlet-1.2	—	—	
0061	Drainage Ditch	Sec32,T32N,R3E	~ 1.6	—	Unknown
0062	Unnamed	Sec6,T31N,R3E	1.55	—	Unknown
0063	Unnamed	LB-0.3	1.1	—	Unknown
	Unnamed Lake	Outlet-0.3	—	—	
	Smith Lake	Outlet-1.1	—	—	
	Kristoferson Lake	Outlet-1.55	—	—	
0064	Unnamed	Sec7,T31N,R3E	1.2	—	None
0068	Unnamed	Sec23,T31N,R2E	1.4	—	None
0069	Unnamed	Sec14,T31N,R2E	1.9	—	Unknown
0070	Unnamed	Sec15,T31N,R2E	1.8	—	Unknown
0071	Unnamed	Sec3,T31N,R2E	1.7	—	None
0073	Unnamed	Sec34,T32N,R2E	1.6	—	Unknown
0075	Unnamed	Sec22,T32N,R2E	2.1	—	None
0076	Unnamed	RB-0.65	1.0	—	None

² Tributaries listed from northern-most point in clockwise order around the island.