

SAN JUAN BASIN

Water Resource Inventory Area 02

The more than 470 islands in this group form the San Juan archipelago. These islands are formed of solid rock outcroppings and range in size from offshore rocks to the largest island, Orcas Island. Land formations vary from glacial plains on Lopez Island to the irregular rock nobs of Orcas Island. Climate in this area is mild with only occasional snowfalls on Mt. Constitution on Orcas Island and less than average rainfall for the region. The Island's vegetation varies from numerous natural grass-shrub clearings to typical stands of Douglas fir. The three largest islands contain the bulk of the freshwater lakes and streams. There are some 46 lakes and reservoirs (908 surface acres) and 24 farm ponds (12 surface acres) located on Orcas and San Juan Islands. The independent drainages are formed from lake outlets, springs, and natural surface and ground water run-off. A total of 88 streams provide over 100 linear miles of independent streams and tributaries located on the major islands. Thirteen streams, more than a mile in length, are located on Orcas Island of which only one supports anadromous fish. Of the eleven streams on San Juan Island more than a mile in length, only two support anadromous fish. Lopez Island has only two small streams neither of which is known to support anadromous fish. Since the independent streams of the is-

lands are mostly intermittent in nature, they have little value for salmon production. The island shorelines usually contain gravel beaches at the confluence of the streams with marine waters.

Fish Inventory and Distribution

Two species of Pacific salmon, coho and chum, currently utilize some small streams of the islands. The salmon populations are restricted in size due to the limited spawning and rearing areas in these short-run streams.

Coho Salmon — The streams reported to support coho salmon include Cascade Creek draining from Cascade and Mountain Lakes on the south side of Mount Constitution and entering East Sound on Orcas Island; an unnamed stream on San Juan Island draining from Beaverton Valley area and entering the marine waters on the east side of the island north of Friday Harbor; also an unnamed stream flowing from the Trout Lake Cady Mountain area and entering marine waters in False Bay on the Southwest coastline of the island.

In addition, intermittent spawning is expected in those island streams that provide access and suitable habitat, but

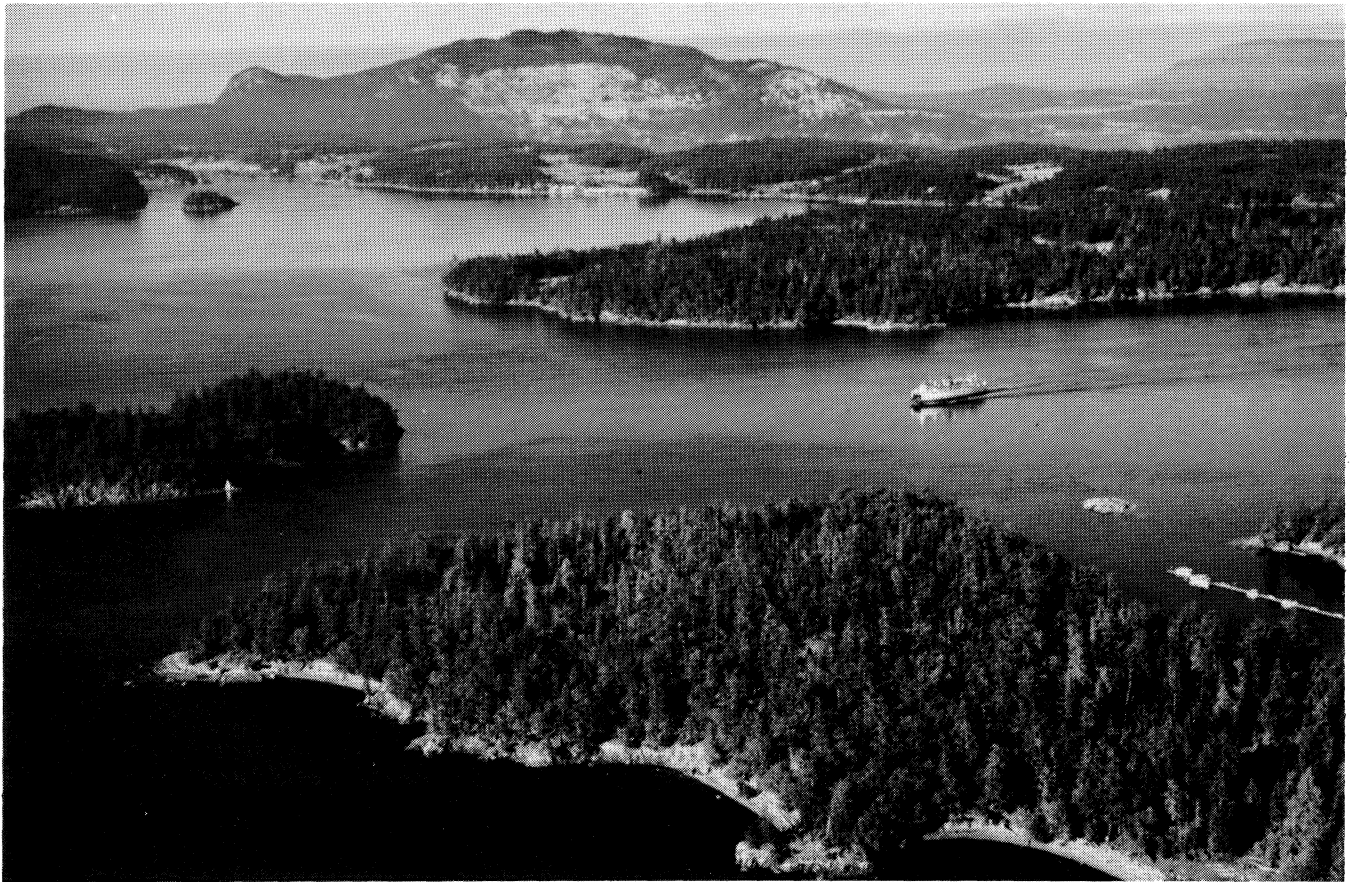


PHOTO 02-1. A view of Orcas Island looking across Wasp Passage toward Deer Harbor (courtesy of Commerce and Economic Development).

only occasional adequate flows. The majority of these small streams remain dry throughout most of the year, containing surface flow during only the winter and early spring months. The adult coho enter the island streams in late November and December, mainly utilizing patch gravel sections throughout the accessible stream length. Spawning is normally completed by late December. In the permanent streams the juvenile coho, following emergence from the gravel, remain in the stream for more than one year and migrate to salt water early in their second year of life. In the smaller intermittent flowing streams the fry are forced to leave the streams as soon as the flows diminish and before they cease altogether. Heavy mortalities occur in these small streams due to dessication. Considerable rearing also takes place in the extensive estuary waters of the basin. Based on spawning and rearing area evaluations, it is estimated that an average escapement of approximately 50 adult coho utilize the small independent streams in these islands.



PHOTO 02-2. An unnamed tributary at False Bay on San Juan Island.

Chum Salmon — Adult chum salmon utilize the same drainages inhabited by coho, plus possibly a few other small intermittent streams. These fish usually enter the streams in December and utilize the patch gravel sections throughout much of the accessible lengths of each water course. The major spawning activity occurs in December. Soon after emergence, the chum fry begin a seaward migration, completing their fresh water life phase in late April or early May. These juvenile chum, along with the juvenile salmon from other basins, find highly suitable estuarine conditions for rearing throughout the many bays, coves, and protected channels interspersed among the islands.

Due to lack of survey data, there is no known escapement level for the island streams; however, it is felt there are insignificant numbers of chum salmon utilizing this watershed.

Salmon Production

All the salmon production that occurs in the island streams is from wild natural spawners. No juvenile salmon plants have been made from hatchery stock in adjacent watersheds into this area. Beginning in December 1970, some 400,000 chum eggs from Big Beef Creek were donated to the San Juan Gillnetters Association and planted in an artificial spawning section of a stream created in the unnamed intermittent creek flowing through Beaverton Valley and draining into marine waters near the University of Washington's Friday Harbor Laboratory. Depending on the success of survival, it is anticipated that this will be a continuing program until adult returns can sustain the run.

Harvest

Salmon produced in the San Juan Island streams contribute a few fish to the U.S. and Canadian, Pacific Ocean sport and commercial fisheries and to the sport and commercial fisheries that exist in the Strait of Juan de Fuca. The estimated total contribution (coho and chum) to these various fisheries is insignificant compared to the mainland Puget Sound basins.

The basin's marine waters contain the most important commercial net fisheries for salmon in the entire state waters. Both the purse seine and gill net fisheries intercept Canadian and Washington returning adult salmon (all species) within these waters. These fisheries generally operate here from mid-May to mid-November with the heaviest effort occurring during July, August, and September. The number of boats drops off drastically after mid-October as the fleets follow the runs to inner Puget Sound areas and the fall heavy weather conditions restrict fishing in the more open waters.

Commercial net harvests from the San Juan areas during the 9-year period 1963 through 1971 show an average catch of 13,500 chinook, 25,800 chum, 85,400 coho, 635,200 sockeye and 755,300 odd-year pink salmon.



PHOTO 02-3. Purse seine fishery in this area is regulated during much of the season by the International Pacific Salmon Commission.

Sport angling for salmon is very popular throughout the island waterways. During 1971 some 127,037 angler trips were logged and 28,355 salmon were harvested, according to punch card returns. These included 19,108 chinook and 7,784 coho plus 1,463 pink salmon. Sport landings of coho diminish drastically after Labor Day from the San Juans as most of the sport effort comes from visiting boaters who reside in the inner Puget Sound ports. The cruising season is generally over for most boaters after this period due to vacation periods and considerable foul weather in fall months. However, the coho are still available throughout these waters until the end of October.

Limiting Factors

Limiting factors refer to conditions that lead to a complete loss or reduction of the environment's fish production potential, excluding harvest or exploration. They include only those conditions presently considered alterable. Within the San Juan basin major limiting factors include lack of constant flowing streams, limited spawning and rearing areas and cascades or falls at stream mouths.

Stream flow — Most of the small independent streams in the islands originate from natural drainage run-off and depend on snow pack, rain, and overflow from natural lakes or ponds to sustain constant flow. Therefore, only a few streams contain sufficient year around flows to sustain coho rearing. Many of the streams are intermittent in nature and flow only during the winter and early spring months, making them suitable only for chum salmon which require no fresh water rearing.

anadromous fish are also dependent on high tide phases to afford passage.

Limited spawning and rearing — There is minimal gravel deposits in most of the island streams due to the solid rock foundation of these islands. Therefore, only short patch gravel spawning areas are present.

Water quality — Poor water quality is not a particularly significant factor within the basin at this time. Water temperatures above those tolerable to salmon are present in most of the streams mainly due to low flow conditions.

Watershed development — Since the islands are extremely attractive for summer home developments, retirement communities, and permanent homes associated with marine recreational facilities and marinas, they would have been completely absorbed for these purposes many years ago except for the limited fresh water supplies, poor soil drainage for septic tanks, and lack of economic stability by local industries such as fish canneries and marine-oriented enterprises. Due to changing work and leisure conditions, there may soon be an expansion of development within the larger islands.

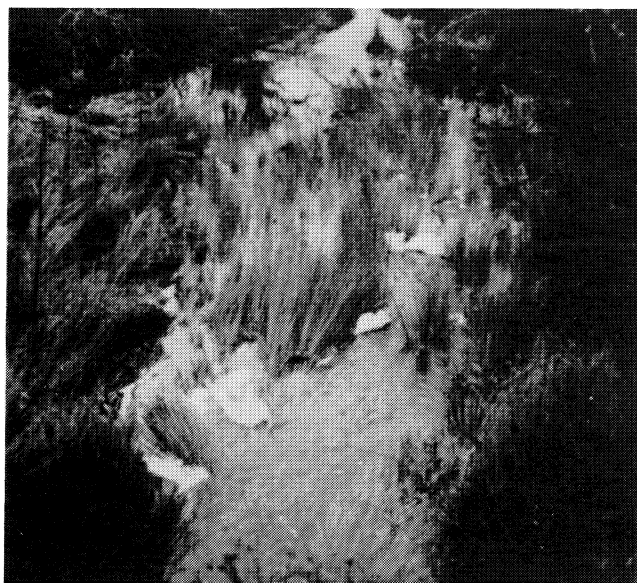


PHOTO 02-4. The intermittent nature of the small streams on the islands limits the potential salmon production.

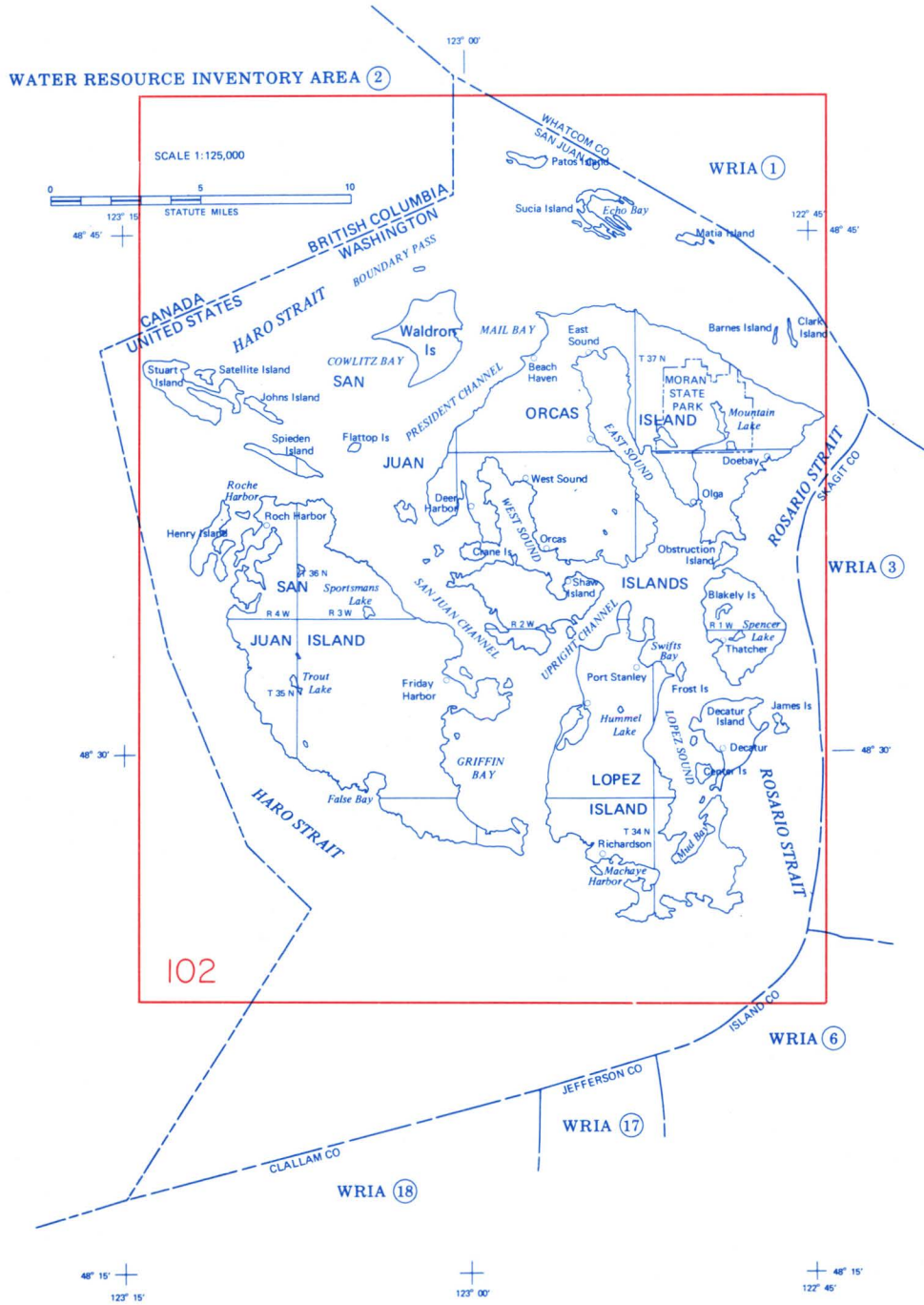
Physical barriers — The rugged, rocky shorelines of the islands in most cases create falls or steep gradients inaccessible to salmon migration at the mouths of streams where they enter salt water. Those streams that are accessible to

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SAN JUAN BASIN

WRIA - 02



SAN JUAN ISLANDS

Independent Drainages

This section covers the entire San Juan Island complex, located east of Anacortes in northern Puget Sound. Access is via ferry out of Anacortes. The islands contain nearly 90 streams, but total only a little more than 100 linear stream miles.

Stream Description

No more than a dozen of the total island drainages offer access or salmon production potential, and within these the area is extremely limited. Two streams on San Juan Island and one on Orcas have reported coho and chum use. The land bordering most island drainages is generally devoted to small farms and scattered rural residences.

On San Juan Island the largest unnamed stream (0027) is located southwest of Friday Harbor. It is 7 miles long and flows generally southeast from a small lake in the Cady Mountain vicinity, entering the head of False Bay on the island's southwest side. It receives two moderate sized tributaries plus a number of intermittent feeder streams, totalling 15.3 stream miles. The upper drainage is fairly steep, then shallows for most of the lower drainage. A few stretches of the main stream and sections of tributaries have been channelized. Through most of the lower area the channel ranges 2-4 yards in width, and presents shallow, slow moving glides and pools separated by occasional riffles. The bottom is mainly fine material with a few short gravel-rubble riffles. There is one small impoundment at R.M. 3.0 and a number of small debris jams along its length. Most banks appear stable and are comprised of low earth cuts maintaining sparse to moderately dense low growing deciduous cover. The more densely forested upper 1-2 miles have not been examined, but are expected to present fairly steep gradient conditions with potential for barriers in the form of cascades or small jams.

The second San Juan Island drainage reported to have occasional salmon use is an unnamed stream (0019) located in Beaverton Valley, entering marine waters just north of Friday Harbor on the island's east side. It is just over 4 miles long and has 2 moderate sized tributaries and a few small feeder drainages adding about 3.5 stream miles. The stream drains predominantly flatland area and has been extensively channelized. Its narrow channel presents mostly slow moving glides and small pools with a few riffles, particularly over its lower half mile. The bottom is fine material with few gravel patches and some gravel-rubble riffles in the lower stretch. Most banks are stable and maintain limited deciduous growth.

The only stream on Orcas Island having reported salmon use is Cascade Creek, draining from Mount Constitution in Moran State Park. It courses south through Mountain Lake and enters salt water in Buck Bay at the entrance to East Sound. It has 5 miles of mainstem, one moderate sized tributary draining through Cascade Lake, plus a number of small feeder streams that add another 7 stream miles. The majority of the drainage presents steep mountain stream character, with numerous cascades and falls. The bottom is predominantly of rubble and boulder. Anadromous fish access is believed restricted to the lower 0.25 to 0.5 mile where the

gradient decreases and offers a few gravel-rubble riffles and patch gravel areas. Cover is moderate to dense throughout the drainage, mainly of mixed deciduous and coniferous trees. Development is quite limited, with the small community of Olga being the only populated area. The principal activity is recreation.

Salmon Utilization

Salmon spawning populations have been reported only in those streams listed under the stream description section above. Extensive juvenile salmon rearing occurs along the many miles of island shorelines, and the surrounding marine waters serve as a major transportation route for adult salmon destined for other areas.

Limiting Factors

The limited amount of available stream habitat is the major factor prohibiting any significant salmon production from island drainages. Year around flows are insufficient and many streams are inaccessible due to steep gradient. Anticipated water requirements with increases in population could further decrease available production habitat.

Beneficial Developments

A limited chum salmon production program was undertaken on a small stream near Friday Harbor. There have been no other projects or facilities developed in this area specifically to benefit salmon production. Many of the islands protected bays offer opportunity for salt water rearing programs.

Habitat Needs

For the existing production streams a principal requirement is to maintain adequate flows, particularly during critical spawning and rearing seasons. Existing stream-side cover, stream profile, and streambed conditions should also be preserved.



PHOTO 02-5. Purse seine fleet on the "Salmon Banks" of San Juan Island.

SAN JUAN ISLANDS

Independent Drainages



SAN JUAN ISLANDS—INDEPENDENT DRAINAGES
San Juan Basin—WRIA 02

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
	WALDRON ISLAND ¹				
0005	Unnamed	Sec20,T36N,R3W	1.95	—	Unknown
0011	Unnamed	Sec34,T36N,R3W	3.85	—	Unknown
	Sportsmans Lk.	Outlet-1.15	—	—	
	Egg Lake	Outlet-1.89	—	—	
	Three Corners Lk.	Outlet-3.85	—	—	
0019	Unnamed	Sec11,T35N,R3W	4.2	—	Unknown
0020	Unnamed	LB-0.75	1.4	—	Unknown
0023	Unnamed	LB-2.1	1.3	—	Unknown
0026	Unnamed	Sec26,T35N,R3W	1.1	—	
0027	Unnamed	Sec33,T35N,R3W	7.0	—	(Coho), (Chum)
0028	Unnamed	LB-0.85	3.1	—	(Coho), (Chum)
	Unnamed Lk.	Outlet-3.1	—	—	
0032	Unnamed	LB-3.1	1.25	—	Unknown
0033	Unnamed	RB-4.1	3.55	—	(Coho)
	Trout Lk.	Outlet-2.1	—	—	
0036	Unnamed	RB-4.75	1.4	—	Unknown
	Unnamed Lk.	Outlet-1.4	—	—	
0038	Unnamed	LB-5.6	1.1	—	Unknown
0041	Unnamed	Sec33,T35N,R3W	3.1	—	(Coho), (Chum)
	Unnamed Lk.	Outlet-2.5	—	—	
0044	Unnamed	Sec24,T35N,R4W	1.1	—	Unknown
0046	Unnamed	Sec11,T35N,R4W	1.5	—	Unknown
0047	Unnamed	Sec36,T36N,R4W	2.5	—	(Coho), (Chum)
0048	Unnamed	LB-1.15	1.3	—	Unknown
	ORCAS ISLAND ²				
0054	Unnamed	Sec36,T37N,R1W	1.2	—	None
0055	Unnamed	Sec2,T36N,R1W	1.3	—	Unknown
0056	Unnamed	Sec9,T36N,R1W	2.6	—	Unknown
0057	Cascade Cr.	Sec9,T36N,R1W	5.1	—	(Coho), (Chum)
0058	Unnamed	RB-1.5	1.9	—	None
	Cascade Lk.	Outlet-0.5	—	—	
0059	Unnamed	LB-0.6	1.7	—	None
0060	Unnamed	LB-1.0	2.8	—	None
	Unnamed Pond	Outlet-5.1	—	—	
0062	Paul Creek	RB-2.3	1.2	—	None
	Mountain Lake	Outlet-3.0	—	—	

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

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

SAN JUAN ISLANDS—INDEPENDENT DRAINAGES
San Juan Basin—WRIA 02

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0063	Unnamed	Sec24,T37N,R2W	2.3	—	Unknown
0064	Unnamed	Sec22,T37N,R2W	1.8	—	None
0065	Unnamed	RB-0.3	1.0	—	None
0068	Unnamed	Sec23,T36N,R2W	1.5	—	None
0069	Unnamed	Sec22,T36N,R2W	2.4	—	Unknown
0070	Unnamed	RB-0.5	1.1	—	Unknown
0071	Unnamed	Sec4,T36N,R2W	2.7	—	Unknown
0072	Unnamed	RB-0.4	2.0	—	Unknown
0073	Unnamed	Sec5,T36N,R2W	1.4	—	None
0074	Unnamed	Sec5,T36N,R2W	1.4	—	None
0075	Unnamed	Sec5,T36N,R2W	1.1	—	None
0076	Unnamed	Sec7,T36N,R2W	1.5	—	Unknown
0078	Unnamed	Sec21,T37N,R2W	1.4	—	Unknown
	CYPRESS ISLAND ³				
0085	Unnamed	Sec32,T36N,R1E	1.2	—	None

³ Tributaries listed from northern-most point in clockwise order around islands.