

Summary of Fish Catch Results for Jacksons Beach, Jacksons Lagoon and Jacksons Spit 2008 and 2009

Skagit River System Cooperative Research Program

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Beach seine sampling for fish was conducted at Jacksons Beach, Jacksons Lagoon and Jacksons Spit as part of Washington State's Salmon Recovery Funding Board Project # 07-1863 N: *WRIA2 Habitat Based Assessment of Juvenile Salmon*, also locally known as the *Big Picture Project*.

These sites are located on the east side of San Juan Island within the San Juan Islands (Figure 1). Jacksons Beach and Jackson Spit are located on the nearshore adjacent to the lagoon and Jacksons Lagoon site is located inside the lagoon along the southern shore. Large net beach seines were used at Jacksons Beach and small net beach seines were used at Jacksons Lagoon and Jacksons Spit after methods described in Skagit System Cooperative Research Department (2003). We made 22 large net sets (Jacksons Beach) and 50 small net beach seine sets (25 each at Jacksons Lagoon and Jacksons Spit) over the two-year study period. Beach seining occurred at Jacksons Lagoon and Jacksons Spit monthly March through September of both years. Sampling at Jacksons Beach was conducted in March and April and then monthly June through September in 2008. In 2009 sampling occurred monthly March through October.

The beach seine sites within Jacksons Beach and Jacksons Spit consisted primarily of gravel to mixed coarse substrate, while at Jacksons Lagoon the substrate was primarily mud to fine silts. All three locations were usually without vegetative cover (such as eelgrass, kelp or other macro algae) within the set area. Average maximum water depth at Jacksons Beach was 2.37 meters (m) deep, 0.68 m at Jacksons Lagoon and 0.94 m at Jacksons Spit. The average salinity was around 31 parts per thousand within the area seined at all three sites. The water temperatures varied by month and site. At Jacksons Beach the temperature ranged from a low of 7.0 °C in March 2009 to a high of 12.9 °C in August of 2008. At Jacksons Lagoon and Jacksons Spit the low temperatures were 7.8 °C and 7.0 °C, respectively, in March 2009. The high temperatures, occurring in July 2009, were 21.5 °C at Jacksons Lagoon and 19.4 °C at Jacksons Spit.

At Jacksons Beach we caught a total of 43,459 fish from 42 different species or species groupings over the two-year study period, including four species of juvenile salmon and three species of forage fish (Table 1). The most abundant fish species was Pacific sand lance with a total catch (both age classes of fish combined) of 38,603 fish, present in 59.1% of the beach seine sets. The sand lance accounted for 88.8% of the total catch at Jacksons Beach. Most of the sand lance (30,968) were caught in one set on July 27, 2009. We kept count of Dungeness crab (249) caught by seines, as this species is of commercial and recreational interest.

At Jacksons Lagoon we caught a total of 2,067 fish from 19 different species or species groupings over the two-year study period, including two species of juvenile salmon and one species of forage fish (Table 2). The most abundant fish species was Pacific staghorn sculpin with a total catch of 756 fish, present in 100.0% of the beach seine sets. They accounted for 36.6% of the total catch at Jacksons Lagoon. We kept count of Dungeness crab (3) caught by seines, as this species is of commercial and recreational interest.

At Jacksons Spit we caught a total of 600 fish from 12 different species or species groupings over the two-year study period, including one species of forage fish (Table 3). Juvenile salmon were not caught at this site. The most abundant fish species was Pacific staghorn sculpin with a total catch of 388 fish, present in 92.0 % of the beach seine sets. They accounted for 64.7% of the total catch.

Please refer to Beamer and Fresh (2012) for more information regarding timing, abundance, and habitat selection of focal fish species for the Big Picture Project. The focal species are: Chinook salmon, chum salmon, pink salmon, Pacific herring, surf smelt, Pacific sand lance, and hexagrammids (greenlings and lingcod).

References

Beamer, EM and KL Fresh. 2012. Juvenile Salmon and Forage Fish Presence and Abundance in Shoreline Habitats of the San Juan Islands, 2008-2009: Map Applications for selected fish species. Report to San Juan County Department of Community Development and Planning and San Juan County Marine Resources Committee. Friday Harbor, WA.

Skagit System Cooperative Research Department. 2003. Estuarine fish sampling methods. Skagit River System Cooperative. LaConner, WA. Available: <http://www.skagitcoop.org/documents>



Figure 1. Location of Jacksons Beach, Jacksons Lagoon and Jacksons Spit beach seine sites.

Table 1. Fish catch summary for Jacksons Beach beach seining, 2008 and 2009

Assemblage Groupings	Taxonomic group	Genus species, age & mark	Common name	Species abbreviation	Total catch	Catch per set	Frequency in catch
Crabs and shrimp	Cancridae	Cancer magister <6.5"	Dungeness crab, sublegal size	DUNGI small	249	11.32	45.5%
Flatfish	Bothidae	Citharichthys sordidus	Pacific sanddab	DAB	1	0.05	4.5%
		Psettichthys melanostictus	Sand sole	SAND SOLE	46	2.09	18.2%
	Pleuronectiformes	Lepidopsetta bilineata	Rock sole	ROCK SOLE	1	0.05	4.5%
		Isopsetta isolepis	Butter sole	BUTTER SOLE	2	0.09	9.1%
		Platichthys stellatus	Starry flounder	STARRY	13	0.59	36.4%
		Other or unknown flatfish post larval	Unidentified post larval flatfish species	O/U FLAT pl	22	1.00	13.6%
		Other or unknown flatfish	Unidentified flatfish species	O/U FLAT	165	7.50	36.4%
		Parophrys vetulus	English sole	ENG SOLE	516	23.45	54.5%
Forage fishes	Ammodytidae	Ammodytes hexapterus post larval	Pacific sand lance, post larval juvenile	LANCE pl	33	1.50	9.1%
		Ammodytes hexapterus adult body form	Pacific sand lance, adult body form	LANCE a	38570	1753.18	59.1%
	Clupeidae	Clupea pallasii adult body form	Pacific herring, adult body form	HERR a	6	0.27	9.1%
	Osmeridae	Hypomesus pretiosus post larval	Surf smelt, post larval juvenile	SMELT pl	11	0.50	9.1%
		Hypomesus pretiosus adult body form	Surf smelt, adult body form	SMELT a	279	12.68	13.6%
Greenlings/lingcod	Hexagrammidae	Ophiodon elongatus	Lingcod	LINGCOD	2	0.09	9.1%
		Hexagrammos stelleri	Whitespot greenling	WHITESPOT GR	27	1.23	18.2%
		Hexagrammos spp	Unidentified greenling species	O/U GREENLING	63	2.86	40.9%
Gunnels and Pricklebacks	Pholidae	Pholis laeta	Crescent gunnel	CRES GUNL	7	0.32	9.1%
		Pholis ornata	Saddleback gunnel	SADLBCK GUNL	10	0.45	9.1%
		Apodichthys flavidus	Penpoint gunnel	PENPT GUNL	20	0.91	18.2%
		Unidentified Gunnel Species	Unidentified gunnel species	GUNNEL	283	12.86	22.7%
Gunnels and Pricklebacks	Stichaeidae	Lumpenus sagitta	Snake prickleback	SNAKE	824	37.45	36.4%
Other - marine	Agonidae	Other or unknown Agonid	Unidentified poacher species	O/U POACHER	5	0.23	13.6%

Assemblage Groupings	Taxonomic group	Genus species, age & mark	Common name	Species abbreviation	Total catch	Catch per set	Frequency in catch
	Myctophidae	Myctophid spp.	Lanternfish species	LANTERNFISH	1	0.05	4.5%
	Syngnathidae	Syngnathus griseolineatus	Bay pipefish	PIPEFISH	6	0.27	13.6%
Pacific salmon	Salmonidae	Oncorhynchus kisutch age 1+ no external mark	Coho salmon, wild yearling	CO 1+ nem	1	0.05	4.5%
		Oncorhynchus tshawytscha age 0+ external mark	Chinook salmon, hatchery marked subyearling	CK 0+ em	2	0.09	9.1%
		Oncorhynchus gorbuscha age 0+	Pink salmon, subyearling	PK 0+	72	3.27	13.6%
		Oncorhynchus keta age 0+	Chum salmon, subyearling	CH 0+	80	3.64	22.7%
Rockfish	Scorpaenidae	Sebastes diploproa	Splitnose rockfish	SPLITNOSE ROCKFSH	7	0.32	4.5%
Sculpins	Cottidae	Arteidius fenestralis	Padded sculpin	PADD SCULP	2	0.09	4.5%
		Hemilepidotus hemilepidotus	Red Irish lord	RED IRISH LORD	4	0.18	9.1%
		Enophrys bison	Buffalo sculpin	BUFF	8	0.36	18.2%
		Clinocottus acuticeps	Sharpnose sculpin	SHARPNOSE	9	0.41	22.7%
		Blepsias cirrhosus	Silverspotted sculpin	SILVER SPOT SC	15	0.68	18.2%
		Gilbertidia sigalutes	Soft sculpin	SOFT SCULP	64	2.91	31.8%
		Myoxocephalus polyacanthocephalus	Great sculpin	GRT SCULP	329	14.95	54.5%
		Leptocottus armatus	Pacific staghorn sculpin	STAG	375	17.05	86.4%
		Other or unknown Cottid	Unidentified sculpin species	O/U SCULP	1274	57.91	63.6%
		Hemitripterae	Nautichthys oculofasciatus	Sailfin sculpin	SAILFIN	3	0.14
	Liparidae	Snailfish spp	Unidentified snailfish species	SNAILFISH	4	0.18	13.6%
Sea perches	Embiotocidae	Cymatogaster aggregata	Shiner perch	SHINER	130	5.91	22.7%
Sticklebacks	Gasterosteidae	Gasterosteus aculeatus	Three spined stickleback	STICKL	93	4.23	36.4%
True cods	Gadidae	Other or unknown Cod	Unidentified true cod species	O/U COD	12	0.55	4.5%
		Theragra chalcogramma	Alaska pollock	POLLOCK	24	1.09	13.6%
		Microgadus proximus	Pacific tomcod	TOMCOD	38	1.73	18.2%

Table 2. Fish catch summary for Jacksons Lagoon beach seining, 2008 and 2009.

Assemblage Groupings	Taxonomic group	Genus species, age & mark	Common name	Species abbreviation	Total catch	Catch per set	Frequency in catch
Crabs and shrimp	Canceridae	Cancer magister <6.5"	Dungeness crab, sublegal size	DUNGI small	3	0.12	12.0%
Flatfish	Pleuronectiformes	Parophrys vetulus	English sole	ENG SOLE	1	0.04	4.0%
		Other or unknown flatfish	Unidentified flatfish species	O/U FLAT	1	0.04	4.0%
		Platichthys stellatus	Starry flounder	STARRY	29	1.16	40.0%
Forage fishes	Osmeridae	Hypomesus pretiosus adult body form	Surf smelt, adult body form	SMELT a	4	0.16	4.0%
		Hypomesus pretiosus post larval	Surf smelt, post larval juvenile	SMELT pl	48	1.92	20.0%
Greenlings/lingcod	Hexagrammidae	Hexagrammos spp	Unidentified greenling species	O/U GREENLING	3	0.12	12.0%
Gunnels and Pricklebacks	Pholidae	Unidentified Gunnel Species	Unidentified gunnel species	GUNNEL	2	0.08	8.0%
		Pholis ornata	Saddleback gunnel	SADLBCK GUNL	2	0.08	8.0%
	Stichaeidae	Lumpenus sagitta	Snake prickleback	SNAKE	38	1.52	4.0%
Other - marine	Batrachoididae	Porichthys notatus	Plainfin midshipman	MIDSHIPMAN	1	0.04	4.0%
	Gobiidae	Clevelandia ios	Arrow goby	ARROW GOBI	89	3.56	68.0%
	Syngnathidae	Syngnathus griseolineatus	Bay pipefish	PIPEFISH	1	0.04	4.0%
Pacific salmon	Salmonidae	Oncorhynchus tshawytscha age 0+ no external mark	Chinook salmon, wild subyearling	CK 0+ nem	1	0.04	4.0%
		Oncorhynchus gorbuscha age 0+	Pink salmon, subyearling	PK 0+	1	0.04	4.0%
Sculpins	Cottidae	Myoxocephalus polyacanthocephalus	Great sculpin	GRT SCULP	2	0.08	4.0%
		Other or unknown Cottid	Unidentified sculpin species	O/U SCULP	9	0.36	12.0%
		Clinocottus acuticeps	Sharpnose sculpin	SHARPNOSE	45	1.80	28.0%
		Leptocottus armatus	Pacific staghorn sculpin	STAG	756	30.24	100.0%
Sea perches	Embiotocidae	Cymatogaster aggregata	Shiner perch	SHINER	718	28.72	64.0%
Sticklebacks	Gasterosteidae	Gasterosteus aculeatus	Three spined stickleback	STICKL	316	12.64	88.0%

Table 3. Fish catch summary for Jacksons Spit beach seining, 2008 and 2009.

Assemblage Groupings	Taxonomic group	Genus species, age & mark	Common name	Species abbreviation	Total catch	Catch per set	Frequency in catch
Flatfish	Pleuronectiformes	Parophrys vetulus	English sole	ENG SOLE	4	0.16	8.0%
Forage fishes	Osmeridae	Hypomesus pretiosus post larval	Surf smelt, post larval juvenile	SMELT pl	1	0.04	4.0%
Greenlings/lingcod	Hexagrammidae	Hexagrammos spp	Unidentified greenling species	O/U GREENLING	6	0.24	16.0%
Gunnels and Pricklebacks	Pholidae	Pholis ornata	Saddleback gunnel	SADLBCK GUNL	1	0.04	4.0%
		Unidentified Gunnel Species	Unidentified gunnel species	GUNNEL	8	0.32	4.0%
Other - marine	Gobiidae	Clevelandia ios	Arrow goby	ARROW GOBI	1	0.04	4.0%
Rockfish	Scorpaenidae	Other or unknown Scorpaenids	Unidentified rockfish species	O/U ROCKFISH	1	0.04	4.0%
Sculpins	Cottidae	Myoxocephalus polyacanthocephalus	Great sculpin	GRT SCULP	1	0.04	4.0%
	Cottidae	Clinocottus acuticeps	Sharpnose sculpin	SHARPNOSE	9	0.36	20.0%
	Cottidae	Leptocottus armatus	Pacific staghorn sculpin	STAG	388	15.52	92.0%
Sea perches	Embiotocidae	Cymatogaster aggregata	Shiner perch	SHINER	167	6.68	24.0%
Sticklebacks	Gasterosteidae	Gasterosteus aculeatus	Three spined stickleback	STICKL	13	0.52	36.0%