

Salmon Shark Movements and Diet

During the summers of 1998-2001 scientists at the Auke Bay Laboratory investigated the movements and diet of salmon sharks (*Lamna ditropis*) aggregating in Prince William Sound (PWS), Alaska. We estimated the composition and biomass of prey consumed by salmon sharks during July and August in Port Gravina, a bay in southeast PWS. We (1) investigated salmon shark seasonal residency in PWS by observing movements from tagging; (2) described salmon shark prey composition by sampling and analyzing stomach contents; and (3) estimated the abundance of aggregating salmon sharks in Port Gravina from aerial strip surveys. During the study we tagged 246 salmon sharks with conventional (spaghetti) tags and 16 salmon sharks with satellite transmitters. Movement data from satellite tag transmissions and conventional tag recoveries provided insights into the seasonal residency and movement patterns of salmon sharks in PWS and the eastern North Pacific Ocean. Our observations suggest that salmon sharks are attracted by Pacific salmon (*Oncorhynchus spp.*) runs returning to the streams and hatcheries in PWS during summer months. In PWS large salmon shark aggregations were with peak salmon spawning migrations during July and August. As the summer salmon runs declined in late summer, the sharks dispersed. Some continued to forage in PWS and the Gulf of Alaska into autumn and winter months, while others underwent rapid migrations hundreds to thousands of kilometers toward the west coasts of Canada and the United States. Fifty percent of the sharks tracked by this study traveled long distances.

Adult Pacific salmon (pink, *Oncorhynchus gorbuscha*, chum, *Oncorhynchus keta*, and coho, *Oncorhynchus kisutch*) were the principal prey as measured by both percent number (35%) and percent weight (76%). Even when adult salmon were locally abundant, salmon sharks had a varied diet that included squid (*Teuthoidea spp.*), sablefish (*Anoplopoma fimbria*), Pacific herring (*Clupea pallasii*), rockfish (*Sebastes spp.*), Eulachon (*Thaleichthes pacificus*), capelin (*Mallotus villosus*), spiny dogfish (*Squalus acanthias*), arrowtooth flounder (*Atheresthes stomas*), and cods (*Gadidae*). We estimated that salmon sharks consumed at least 263,000 kg of prey in Port Gravina during a 45 day period of peak salmon shark abundance in 2000. Assuming the sharks consumed equal proportions of pink and chum salmon by weight the sharks would have consumed 116,000 pink salmon and 36,000 chum salmon. Based on Alaska Department of Fish and Game estimates of salmon escapement and commercial harvest for Port Gravina in 2000, the sharks would have consumed 12% and 29% of the pink and chum salmon runs, respectively. Project details are presented in the *Exxon Valdez* Oil Spill Restoration Project (02396) Final Report. A journal manuscript is in peer review.