

WINTER OBSERVATIONS OF SOUTHERN RESIDENT KILLER  
WHALES (*ORCINUS ORCA*) NEAR THE COLUMBIA RIVER PLUME  
DURING THE 2005 SPRING CHINOOK SALMON  
(*ONCORHYNCHUS TSHAWYTSCHA*) SPAWNING MIGRATION

JEANNETTE E ZAMON, TROY J GUY, KENNETH BALCOMB, AND DAVID ELLIFRIT

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In the northeastern Pacific Ocean, the North American population of southern resident Killer Whales (*Orcinus orca*, hereafter “SRKW”) was listed as “Endangered” by the United States government effective 16 February 2006 (NMFS 2005a). There is significant scientific interest in filling data gaps regarding SRKW habitat use and ecology from November to April because few data are available about the winter distribution and feeding behavior of SRKW (Ford and Ellis 2006; Krahn and others 2004). From May to October, these whales occur primarily in US and Canadian waters of Juan de Fuca Strait, the Canadian Gulf Islands, the US San Juan Islands, and Georgia Strait (Fig. 1), where their diet appears to be dominated by adult Chinook Salmon (*Oncorhynchus tshawytscha*) (Ford and Ellis 2006; Ford and others 1998). After October, the southern residents expand their range to include Puget Sound as well as the outer coast of Vancouver Island, Washington, Oregon, and California (Krahn and others 2004). Between 1975 and 2004, there have been only 17 confirmed sightings of SRKW between November to April (Krahn and others 2004), and 12 of those winter sightings were from the outer coast.

To our knowledge, this is the first published report that describes SRKW behavior at the mouth of the Columbia River and also positively identifies individual SRKW associated with that behavior (Krahn and others 2004; NMFS 2005b). We report confirmed sightings of at least 13 photo-identified SRKW individ-

uals from L-pod, the largest of the 3 pods in the southern resident population (NMFS 2005b).

The Columbia River mouth is approximately 245 km south of the entrance to the Strait of Juan de Fuca. The river forms the border between southern Washington and northern Oregon, USA, and it supports spring, summer, and fall runs of Chinook Salmon, with the fall run being the largest (Healey 1991). Beginning in August 2004, 2 of the authors (JEZ and TJG) conducted year-round, weekly or bi-weekly surveys of marine birds and mammals from a land-based observation site 6 km north of the Columbia River mouth. From dawn to dusk we counted birds and mammals within a specific 1.8 km<sup>2</sup> area every half-hour during all daylight hours using a 20× spotting scope from an overlook at the North Head Lighthouse in Washington State (NAD 1983 UTM zone 10: Easting 417191.55, Northing 5127731.94; elevation 59 m above sea level). Additionally, we used 8× binoculars and Fujinon 25× “Big Eyes”<sup>1</sup> to aid species identification and to observe behavior between the half-hourly counts. These surveys documented variation in marine bird and mammal abundance relative to changes in tidal phase, time of day, and the strength and position of a visible boundary between river water and oceanic water. This boundary between newly discharged river water and oceanic water, hereafter called the “plume front”, often manifests as a continuous, turbulent white foam line extending from river mouth offshore for up to 46 km (Morgan and others 2005).

On 22 March 2005, the survey began at 06:45 local time. At 06:51, the observers (JEZ

<sup>1</sup> Use of trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.