Resident and Transient-type Killer Whales, *Orcinus orca,* in Southeast Kamchatka, Russia

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ABSTRACT

Killer whales, *Orcinus orca,* were studied in Avacha Gulf, southeast Kamchatka, in the Russian Far East (RFE) from 1999-2003 using land- and boat-based photo-identification and sound recordings. A total of 121 photographically identified killer whales in the area have been determined to be residents based on (1) site fidelity with frequent re-sightings, (2) observations of predation on fish and (3) the recording of stable, resident-type dialects. The study has also documented transient-type marine mammal hunting killer whales in the RFE through morphological observations and biopsy documentation of contaminant levels and genetic characteristics. On 26 September 2003, some 32-37 resident-type killer whales were captured by the Utrish Dolphinarium Ltd, six of which had been photo-identified in previous years. One young female drowned in the nets; another young female was removed and sent to the Utrish Dolphinarium where she subsequently died. No more captures should be permitted until more is known about the population structure and population sizes of RFE killer whales.

KEYWORDS: KILLER WHALE, *ORCINUS ORCA*, PACIFIC OCEAN, PHOTO-ID, FOOD/PREY, LIVE-CAPTURE, CONSERVATION

INTRODUCTION

As part of a long-term research project on killer whales, *Orcinus orca,* in the Russian Far East (RFE), killer whales were studied in Avacha Gulf, southeast Kamchatka, from 1999-2003 using land- and boat-based photo-identification and sound recordings (Burdin et al. 2001, 2004b).

METHODS

The study is based on the method of photographic individual identification (Photo ID) developed and established by Michael A. Bigg and his colleagues (Bigg et al. 1990). More than 10,000 photographs have been taken using Canon SLR film and digital cameras with up to 400mm telephoto lenses. Small boats used were a rigid hull inflatable boat with inboard-outboard engine and an inflatable boat with outboard engine. Underwater sound recording was conducted with a Sony DAT TCD-D100 recorder and Offshore Acoustics hydrophones, with a frequency range of 10 Hz to 40 kHz. For the land-based behavioural observations, various binoculars, e.g., Fujinon 7x50, Baigish 10x50 and 12x50, and spotting scopes (Geoma 25x60) were used along with an electronic theodolite tracking system (Nikon DTM-520) to track each killer whale group and its activities. Pythagoras (version 1.2.15, Glenn Gailey, Joel Ortega) was used to record and analyze the data. For every observation, the land-based team recorded data showing group composition, activity, direction of movement or travel, and dispersion and gatherings of various groups. The land-based team also acted as scouts, reporting the arrival and general movements of killer whales to the boat-based mobile team which then took photo-Ids and recorded the whales.

RESULTS

During parts of five summers, 1999-2003, using land- and boat-based photo-identification and sound recordings, the study identified a total of 121 resident-type killer whales in the area from Cape Shipunsky to Cape Prutkov. The ratio of resighted individuals increased between 2002 and 2003 from 26% to 36.4%, while the ratio of new animals identified has decreased, from 38% in 2002 (n=38) to 17.4% (n=21) in 2003. Out of the total 121 identified animals, 69.4% (n=84) were resighted at least once.

Evidence that these 121 animals are resident-type killer whales, comparable to fish-eating residents found in the northeast Pacific (off Vancouver Island to Alaska), is as follows:

(1) There is documented site-fidelity in Avacha Gulf with frequent re-sightings of individuals and groups both within each year and from year to year.

(2) Killer whales are observed preying on fish individually and in groups using carousel-type feeding in which they surround fish prey (Tarasyan et al. 2003, Tarasyan in press, Mironova et al. 2002); prey includes *Pleurogrammus* sp., *Oncorhynchus* sp., *Theragra* sp. and others. Killer whales have not been observed attacking largha seals (*Phoca largha*), Steller sea lions (*Eumetopias jubatus*), sea otters (*Enhydra lutris*), Dall's porpoises (*Phocoenoides dalli*), harbour porpoises (*Phocoena phocoena*), minke whales (*Balaenoptera acutorostrata*) and sperm whales (*Physeter macrocephalus*), although all these species are present in the gulf.

(3) Resident-type killer whale dialects, similar in structure and complexity to those recorded in the eastern North Pacific (Ford 1989, 1991) have been recorded in Avacha Gulf. These dialects are stable from year to year (Filatova et al. 2003).

There are also known to be transient-type, marine mammal hunting killer whales in the Russian Far East, though none were observed in Avacha Gulf until 2003. The first suspected transient group was identified on July 19, 2003, between Russkaya Bay and Listvinichnaya Bay. Evidence was morphological as well as behavioural: the appearance of the dorsal fin and saddle added to the elusive swimming behavior, such as are typically found in transients from the eastern North Pacific.

Reports exist of marine mammal hunting as well as marine mammal tissues being found in orca stomach studies in the past (Nishiwaki and Handa 1958; reports of killer whales hunting marine mammals in Sevostrybvod records, *see* Mironova et al. 2002). Off northeast Sakhalin Island, outside our usual study area, a suspected transient killer whale has been photo-IDed and biopsied. From its morphology, very high contaminant levels (three times that of resident-type killer whales) and genetic characteristics (AT1 transient haplotype), it was concluded that this animal is transient-type (Burdin et al. 2004a). No transient-type sounds have yet been recorded in the Russian Far East.

On 26 Sept 2003, some 32-37 resident-type killer whales were encircled by seine nets in Zhirovaya Bay, Avacha Gulf by the Utrish Dolphinarium. The animals captured, all of which had been travelling together, included 3 mother-calf pairs, 3 small juveniles, 8 young to mature males and 15-20 others. Six of these animals were known through previous photo-ID to the FEROP research team, having been photographed in previous years in Avacha Gulf. According to the permit held by Utrish Dolphinarium, up to four killer whales were allowed to be taken in 2003 from eastern Kamchatkan waters.

During the capture, one subadult female became entangled in the net and drowned. A second young animal, sex unknown, also became entangled but it is not known if this animal survived. A third young whale, a female, was removed from the group, and kept in a pen for nine days before being transported 7,000 miles (11,270 km) by air on 5 Oct to the Utrish Marine Station owned by the Utrish Dolphinarium Ltd, on the Black Sea coast. The captive female died just 13 days after transfer on 19 October 2003.

Sounds made by the captive female, recorded as she was lifted by the sling on to the boat, are similar to the call types used by one of the resident-type groups of Avacha Gulf, providing further evidence besides the photo-IDs that these were resident animals. Some limited biopsies were also taken but have not been analyzed and compared yet to biopsies from the field studies.

DISCUSSION

The precise effect of removing two young females from a resident-type group, given the size and critical importance of young breeding or near-breeding females in a small population, may only be surmised. It will take some years to track, monitor and compare cropped with non-cropped groups. At the same time, it is essential that basic information be obtained on the number, size and structure of killer whale populations in the Russian Far East.

Data are inadequate to support any capture quotas at the present time. Consequently, no more killer whale permits should be issued until the full status and population(s) of the species in Russian waters have been established and until the scientists who have studied them recommend that there will be no detrimental effect from capture.

These concerns are supported by the IUCN/SSC Cetacean Specialist Group's 2002-2010 Conservation Action Plan for the World's Cetaceans, which states that: "When unmanaged and undertaken without a rigorous program of research and monitoring, live-capture can become a serious threat to local cetacean populations" (Reeves et al. 2003). In May 2002, the IWC Scientific Committee declared that killer whale populations in Russian waters and elsewhere should be studied and assessed before any captures occur. Finally, killer whales

are now listed on Appendix II of the Convention on Migratory Species, which states that migratory species with an unfavourable conservation status require international agreements for their conservation and management.

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