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2010 Western Gray Whale Pre-Tagging and Tagging Studies

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2010 WESTERN GRAY WHALE PRE-TAGGING AND TAGGING STUDIES



Contract Report for International Union for Conservation of Nature

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Introduction

From 5 August to 7 October 2010, I participated in pre-tagging (5-28 August) and tagging (29 August to 7 October) studies of western gray whales off northeastern Sakhalin Island, Russia, in the Okhotsk Sea, in an area referred to as the Piltun feeding ground. The objective of the tagging study was to apply implantable satellite tags to 12 western gray whales known through genetic analysis (by the Russia-U.S. western gray whale research program) to be male. My role in the tagging study was to identify candidate males from the tagging vessel, as I am capable of recognizing individual whales real-time given the 10 seasons (1998-2007) I participated in field studies of the Russia-U.S. western gray whale research program and the 13 years (1997-2010) I analyzed photo-identification images associated with that project. As I was not in the field during the 2008 and 2009 seasons, the goal of the pre-tagging study was for me to spend time on the water regaining efficiency and confidence in my ability to identify individual whales. Both the pre-tagging and tagging studies involved the collection of photo-identification images of individual whales from small vessels.

The pre-tagging study was conducted by the Kamchatka Branch of the Pacific Institute of Geography (KBPIG), who also led the Russia-U.S. western gray whale research program (1995-2009). The tagging study was conducted by the Severtsov Institute of Ecology and Evolution (IPEE) in collaboration with Oregon State University (OSU). A Ph.D. Candidate at the University of Washington, I was independently contracted by the International Union for Conservation of Nature to participate in both the pre-tagging and tagging work. I also analyzed the photo-identification images from both studies. While the Principal Investigators from KBPIG, IPEE, and OSU will be reporting on their respective components of these associated efforts, I believe that I am in a unique position to combine and contextualize important aspects of the two studies. Specifically, the objective of this report is to synthesize findings from the photo-identification components of each study and to compare and integrate these results with those of the Russia-U.S. western gray whale research program.

Pre-tagging Study

After arriving to the shore-based field camp at the mouth of Piltun Lagoon on 9 August, the earliest day we could have surveyed was 11 August. However, poor weather conditions (predominantly rain) precluded surveying until 18 August. In total, four pre-tagging surveys were conducted, which averaged 7.8 hrs in length with an average of 17 whales identified per survey (Table 1). Overall, 43 individual whales were identified. Candidate males were encountered on each trip, as were known reproductive females, with a total of 17 and nine identified, respectively. Four calves were identified during the pre-tagging surveys. One calf was still associated with its mom (a known reproductive female) on each of the three occasions it was sighted (19, 23-24 August), while the three other calves were already independent upon first sighting. Five additional young (≤ 4 yrs) whales were sighted, three of those individuals were yearlings. One sighting of interest was a male first identified as a calf in 2003 that had not been observed in the study area since that year.

An agreement was made between KBPIG and IPEE to collect biopsy samples during the pre-tagging study. Although sampling effort was initiated during 23 groups (note that some group sampling attempts were directed at more than one whale), only nine biopsies of eight whales were collected. Of these eight whales, five (three females, two males) were previously sampled by the Russia-U.S. western gray whale research program. The remaining three biopsied whales consisted of a yearling and two calves. While missed sampling shots did occur, the most common reason for aborting sampling effort was boat avoidance behavior by targeted whales. In fact, boat avoidance was the most common behavioral state exhibited by whale groups during the pre-tagging study. Although the following observation cannot be quantified, it was our perception that both the degree and extent of boat avoidance were more pronounced than in previous years. Finally, it is worth mentioning that of the six days of workable weather available during the pre-tagging study period, 1.5 (25%) were lost in order to prepare for the potential visit of Russian Prime Minister Vladimir Putin.

Tagging Study

The base of operations for the tagging study was the ship *Igor Maximov*, which departed Korsakov (southern Sakhalin Island) on 3 September and arrived to the Piltun feeding ground on the evening of 5 September. The first tagging survey took place the following day. In total, 12 tagging surveys were conducted, which averaged 4.9 hrs in length with an average of 13 whales identified per survey (Table 1). Overall, 62 individual whales were identified. Candidate males and known reproductive females were encountered on most surveys, with a total of 25 and 10 identified, respectively. The four calves identified during the pre-tagging surveys were each reencountered during the tagging study, but no additional calves were identified. The calf that was previously associated with its mom during the pre-tagging study was independent by the time it was observed during the 15 September tagging survey, indicating that weaning occurred between that date and 24 August. Nine additional young (≤ 4 yrs) whales were sighted, six of those individuals were yearlings. On a few occasions, groups clearly comprised of young whales were skipped before the vessel was close enough to collect photo-identification images, as young whales were not candidates for tagging. Thus, the identifications made during the tagging study are biased toward older whales. The aforementioned 7-yr-old male was also encountered during the tagging period, as was a 7-yr-old female that had also not been observed in the study area since being a calf in 2003.

I will not focus on the technical aspects and challenges of the tagging program, as they will be covered in detail by the Principal Investigators from IPEE and OSU. None of the 25 tagging candidates were observed to be in compromised body condition and therefore tagging approach effort was initiated each time a candidate was encountered. However, only a few (<10) close approaches to approximately seven individuals (the uncertainty depends on how a close approach is defined) were made and ultimately only one whale (a 13-yr-old) was tagged on 4 October. The use of a fiberglass boat powered by a demonstrably loud jet diesel engine limited opportunities to make close tagging approaches by seemingly disturbing whales at distances as great as 40 m and by reduced

maneuverability and speed control at slow speeds. Once an inflatable vessel with a 40-hp 4-stroke engine was obtained (18 September) and utilized (20 September), the possibility of close tagging approaches increased. However, the boat avoidance behavior noted during the pre-tagging study remained a baseline factor in closing the distance needed to deploy a tag. Finally, it should be noted that of the 13 days of workable weather available during the tagging study period, 1 (8%) was lost in order to construct a tagging platform for the newly-acquired inflatable vessel.

Table 1. Summary of effort and whales identified during western gray whale pre-tagging (conducted by KBPIG) and tagging (conducted by IPEE in collaboration with OSU) surveys off northeastern Sakhalin Island, Russia, in 2010.

Survey Date	Survey Length (hrs)	Whales Identified	Candidates Identified	Reproductive Females Identified	Yearlings Identified	Calves Identified
<i>Pre-tagging</i>						
08/18/2010	12.28	29	10	7	3	0
08/19/2010	11.22	19	4	6	1	3
08/23/2010	3.00	9	4	2	0	1
08/24/2010	4.57	10	4	1	0	3
Total	31.07	43	17	9	3	4
<i>Tagging</i>						
09/06/2010	5.75	12	8	1	0	0
09/12/2010	5.17 ¹	1	0	0	0	0
09/13/2010	4.00	9	3	1	2	0
09/14/2010	4.33	17	6	3	5	0
09/15/2010	5.50	20	5	3	4	4
09/17/2010	1.33	3	2	1	0	0
09/18/2010	4.00	18	13	3	0	0
09/20/2010	1.50	4	2	1	0	0
09/25/2010	4.33	24	8	6	3	1
09/27/2010	9.75	24	12	3	0	0
10/03/2010	3.00	5	3	0	0	0
10/04/2010	9.75	23	9	3	6	2
Total	58.41	62	25	10	6	4
Overall	89.48	75	30	14	6	4

¹Much of the time during this survey was spent conducting an acoustic experiment and then searching for whales, as the receiving buoys used in the experiment were in a region of the study area where few whales were located at that time.

Summary

A total of 75 individuals were identified during the pre-tagging and tagging studies (Table 1), with 13 whales sighted only during the pre-tagging period, 32 during the tagging period, and 30 during both. Although the distribution of whales in the study area was not quantified in either study, individuals were readily encountered in close

proximity to the lagoon mouth during the pre-tagging study, but appeared to be concentrated in the northern portion of the study area during the tagging period. Reproductive females were sighted consistently during the two studies (Table 1), emphasizing the importance of the Piltun feeding area to the productivity of the population.

Despite the bias toward older whales during the tagging study, observations of the four identified calves suggest a continuous presence in the study area. Characterizing the occurrence of other young whales is not straightforward given observed variation in annual return rates, but focusing on yearlings offers one informative measure. While nine young (≤ 4 yrs) non-calves were sighted overall, six (67%) were yearlings (Table 1), representing all but one (86%) of the seven calves identified by the Russia-U.S. western gray whale research program in 2009 (Table 2). As a point of comparison, none of the nine calves identified in 2007 have been resighted on the Piltun feeding ground since that year. Interestingly, these results indicate the potential for a strong cohort effect in some years.

Table 2. A comparison of the 2010 pre-tagging and tagging surveys to annual survey effort, sighting trends, and resighting percentages resulting from the Russia-U.S. western gray whale research program from 1997-2009 (along with a 1995 pilot study).

Year	Sampling Period	Number of Surveys	Whales Identified ¹	Calves Identified	New Non-calves	% Non-calves Previously Identified
1995	08/15-08/19	5	28	2	26	0.0%
1997	07/09-09/08	22	47	2	25	44.4%
1998	07/06-09/29	35	54	8	5	89.1%
1999	06/29-10/13	56	69	3	12	81.8%
2000	06/25-09/16	40	58	3	3	94.5%
2001	06/25-09/25	49	72	6	6	90.9%
2002	07/01-09/25	36	76	9	3	95.5%
2003	07/15-09/13	22	75	11	2	96.9%
2004	07/29-09/12	21	94	9	3	96.5%
2005	07/04-09/09	20	93	6	4	95.4%
2006	07/23-08/25	10	79	4	3	96.0%
2007	07/26-09/09	20	83	9	2	97.3%
2008	07/08-08/21	12	45	3	0	100.0%
2009	06/24-08/26	17	84	7	2	97.4%
2010	08/18-10/04	16	75 ²	4 ³	3	95.8%

¹The number of whales identified annually includes resightings of individuals from previous years.

²The total number of individual whales identified from these sources (1995-2010) is 188.

³The total number of calves identified from these sources (1995-2010) is 86.

The numbers of whales, calves, and new non-calves identified from the pre-tagging and tagging surveys are in line with values obtained by the Russia-U.S. western gray whale research program from 1995-2009 (Table 2). However, it is likely that there is a downward bias in the 2010 numbers given the increased survey effort directed toward biopsy sampling and tagging in that year. Overall, the total number of individual whales

and calves identified by the Russia-U.S. western gray whale research program and the 2010 pre-tagging and tagging studies is 188 and 86, respectively.

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