

FIELD REPORT – CONTROL OF NUISANCE SEA LIONS IN THE ROGUE RIVER ESTUARY, 2007

December 7, 2007

Project participants -- Mark Lottis¹, Jared Grey², Jim Klusman², Emily Hamblen³, Robin Brown³, Bryan Wright³, Susan Riemer³, Todd Confer³, and Garth Griffin⁴

INTRODUCTION

In the early summer of 2005, the Curry Sportfishing Association (CSA) requested the assistance of the National Marine Fisheries Service (NMFS) and the Oregon Department of Fish and Wildlife (ODFW) to work with local business owners, sport fishermen, and the Port of Gold Beach (Port) to reduce the level of sea lion/fishery interaction in the lower Rogue River salmonid sport fisheries (Figure 1). The CSA described California and Steller sea lion presence (feeding and resting) at an all time high and that conflict with these animals was resulting in economic loss to businesses and angler frustration was putting individual sea lions at risk.

In 2006, the CSA, Port, NMFS, and ODFW cooperated in an unprecedented project to reduce the pinniped-fishery conflict (see Lottis et al. 2007). The project entailed implementing and monitoring three concurrent and complimentary actions:

1. Modification of moorage and dock structures to reduce haul-out and resting options for nuisance sea lions in close proximity to the fishery and to limit damage to floating dock structures.
2. Curtailment or elimination of the practice of dumping fish carcasses into the estuary to reduce the attraction of nuisance animals.
3. Use of standard non-lethal pinniped deterrence measures such as above- and below-water noisemakers and pyrotechnics (e.g., cracker shells, seal bombs), and tactile devices (e.g., water hoses, rubber bullets/buckshot) to dissuade nuisance sea lions from hauling-out and taking angler catch.

These actions proved to be highly effective in 2006 at deterring California and Steller sea lions from taking hooked salmon from sport anglers in the Rogue River estuary (Lottis et al. 2007). This report summarizes the continuation of this work in 2007.

¹ Curry Sportfishing Association

² Port of Gold Beach

³ Oregon Department of Fish and Wildlife

⁴ National Marine Fisheries Service

METHODS

Personnel

Project activities were coordinated with state, federal, and local law enforcement agencies as well as Port commissioners, city and county government contacts, Gold Beach business leaders, and community volunteers. Non-lethal deterrent activities were only conducted by the following individuals: Jared Grey (Port of Gold Beach) and Jim Klusman (Port of Gold Beach)

Modification of haulout structures

Selected docks and breakwaters in the Gold Beach marina that had previously been used by pinnipeds (primarily California sea lions) were barricaded in 2006 using a variety of methods (Lottis et al. 2007). These barricades were reinforced and extended during summer 2007 using \$20,000 in funds from an ODFW Fish Restoration and Enhancement grant awarded in December 2006 and labor volunteered by the CSA and Curry Anadromous Fishermen groups.

Fish carcass disposal

From July 20 through October 10, 2007, the Port of Gold Beach's fish cleaning station was closed to the dumping of fish carcasses into the Rogue River bay. Totes were provided at the cleaning station and anglers were asked to place their fish carcasses in the totes for removal. Once a day the totes were emptied into a refrigerated holding unit. Once a week, or as needed, CSA contracted for the removal of the fish carcasses.

Non-lethal harassment

Non-lethal deterrence of sea lions was carried out in a similar manner to that described in Lottis et al. (2007). Briefly, a hazing vessel was marked with an identification placard and began each day with a survey of the marina, lower river and bay. If sea lions were encountered, the hazing vessel would deploy seal control firecrackers nearby and then actively pursue the animals toward the bay entrance and beyond the entrance bar. Once the bay was cleared of sea lions "working the fishery" the hazing vessel would patrol the area or station itself at a vantage point to intercept animals attempting to re-enter the area. For each hazing event, the hazer recorded the general location, the type and amount of deterrents used, and the resulting behavior by the pinniped being hazed.

Monitoring

Monitoring of deterrent activity was carried out in a similar manner to that described in Lottis et al. (2007). Briefly, monitoring and evaluation consisted of three independent

parts: shore-based observations recorded by ODFW Marine Mammal Program staff; boat-based observations recorded by Port staff (see above); and dockside angler interviews conducted by ODFW Ocean Recreational Boat Survey staff.

Shore-based observations.

A single ODFW observer conducted shore-based observations for approximately 4.5 hours/day for 4 days/week (generally WED-SAT) from late June to late September, 2007. Observations were conducted for 1.5 hours in each of three areas of the estuary (lower, middle, and upper estuary; Figure 1), the order of which was randomly determined. Observations started at 0830 each day. At the beginning of an observation period, and every ½ hour thereafter, the observer conducted a scan sample of the area and recorded: time, visibility, the number and species of pinnipeds, the number and type of anglers, and whether the Port hazer was present. This resulted in four scan samples per area per day. During the three intervening 30-min periods between scan samples, the observer conducted a focal-area sample and tallied the frequency of three types of events: predation, angler catch, and hazing. In addition to the scan and focal-area samples, observers conducted haul-out counts at the beginning and end of each day. All field data was entered into a weather-proof Pocket PC using Pendragon database software.

Angler interviews.

As in 2006 (Lottis et al. 2007), an Oregon Recreational Boat Survey (ORBS) port sampler asked all sampled boats whether they had interactions with pinnipeds during their trip, and if so, if they had lost fish as a result.

RESULTS

Modification of haulout structures

In general, haul-out barricades (A-frame, bull rails) installed in 2006 fell into varied levels of disrepair over the course of the intervening year. For example, the A-frame barrier built on the breakwater dock in 2006 had a hole that allowed at least two California sea lions to haulout during 2007. The bull rails installed on the commercial docks in 2006 suffered much more damage and were mostly broken or missing at the start of the 2007 season. In September, two California sea lions occasionally hauled out on the dock across from the Port fish cleaning station-which did not have deterrence fences.

By the end of the 2007 season, the bull rails were repaired and their coverage extended using funds from an ODFW Restoration and Enhancement grant and labor volunteered by the CSA and Curry Anadromous Fishermen groups. In addition, each morning the boat

hazer harassed California sea lions using the docks which appeared to deter them from hauling out again until just before dusk.

Fish carcass disposal

At the beginning of the 2007 season anglers disposed of carcasses directly into the marina. These carcasses were eaten by gulls, vultures, river otters, harbor seals, Steller and California sea lions. By late July, fish were disposed of in bins that were then placed in a refrigerated truck. However, the cleaning stations at several businesses (e.g., Jot's and Lex's Landing) continued to dispose of carcasses directly into the river. The ODFW observer frequently saw sea lions and seals near the fish cleaning chute at Lex's Landing. The cost for carcass removal this year was much greater than for last year because in addition to the dumping of salmon carcasses, anglers and the general public were dumping fish debris from an excellent season of tuna, perch, and rockfish angling,

Non-lethal harassment

Boat-based hazing activities began on 7/14/2007 and ended 10/10/2007. Data from 41 days from 7/17/07 to 9/15/07 were available for summary. Based on the available data, California sea lions were hazed 79 times and Steller sea lions were hazed 83 times; note that the same animal could be hazed multiple times. The median number of engagements per hour of effort for California sea lions and Steller sea lions was 0.25 (Figures 2-3). Baitfish (sardines) were occasionally stunned during hazing activities (approximately 10 events with 25 fish per event).

Monitoring

Shore-based observations

ODFW staff monitored pinniped haul-out abundance, boat activity, and pinniped foraging behavior over 41 days from 7/5/2007 to 9/14/2007. As in 2006, harbor seal haul-out counts declined from a high of approximately 150 animals in July to around 25 by the end of September (Figure 4). California sea lions were only rarely observed hauling-out in 2007 (Figure 5). The average number of boats and pinnipeds (by species) observed in the water during scan samples are summarized in Figures 6-9. With the exception of California sea lions (Figure 8), the patterns observed in 2007 were similar to those observed in 2006.

During focal samples, ODFW documented 111 instances of fish being caught by anglers; of these, none were lost to pinnipeds (Table 1). Twenty-two hazing events were observed, most of which resulted in the animal being moved downriver. Lastly, a total of 16 natural predation events were documented (includes two scavenging events), of which

at least 11 were of free-swimming salmon. Most natural predation events were by harbor seals located in the middle and upper portions of the estuary, late in the afternoon.

In a few cases, baitfish (sardines) were observed at the surface after a seal bomb exploded. However, staff did not observe any signs of injury to marine mammals caused by hazing activities. Furthermore, to the best of our knowledge, neither local, state, nor federal officials received complaints of noise, injury to fish (including salmonids), marine mammals, other wildlife, or people.

Angler interviews

ODFW's Ocean Recreational Boat Survey (ORBS) interviewed anglers from 1,556 boat-trips returning to Gold Beach (6/28-9/29/07). Of the 1,311 estuary trips targeting salmon, just three boats reported losing hooked fish to pinnipeds (for a total of 4 salmon).

Fish passage and injury assessment

The preliminary run size estimates for the Rogue in 2007, based on research seining at Huntley Park (river mile 8) were: 20,720 fall Chinook; 9,099 adult late-run summer steelhead; and 18,757 half-pounder steelhead. An escapement estimate was not yet available for coho at the time of this writing. Research seining at Huntley Park covers nearly the entire run of fall Chinook, but only a portion of the summer steelhead run is sampled because early-run summer steelhead migrate through the system before seining begins.

The seine crew handled a total of 528 fall Chinook (475 adults and 53 jacks), 226 adult summer steelhead, 465 half-pounder steelhead, and 380 coho (343 adults and 37 jacks) at Huntley Park in 2007. No injuries or unusual health conditions were observed (other than the usual hook and predation scars). Furthermore, no migration delay or unusual pre-spawning mortality was observed in the lower Rogue. The ODFW Gold Beach Field Office did not receive any comments or complaints regarding injured/dead salmon or steelhead from anglers or tour boat operators operating in the river.

DISCUSSION

We consider the second year of the comprehensive nuisance pinniped management program in the Rogue River a success. To the best of our knowledge: (1) no hooked fish were lost to pinnipeds while the hazing boat was operated; (2) no pinnipeds, people, or salmon were harmed; (3) almost no California sea lions hauled-out in the marina; and (4) the local community, government, and fishing public continued to be supportive of the program.

California sea lion abundance and interactions in the fishery were lower in 2007 than in recent years. This may be due in part to fewer fish passing through the estuary, fewer

fish holding in the estuary (because of reduced river temperatures), and/or the effects of the three-pronged nuisance pinniped management program. Regardless of the magnitude of the interaction, continuance of the program at some level will likely be necessary in order to maintain the successes to date. We recommend that data on the frequency of interactions and use of deterrents by the hazing boat continue to be collected and reported. However, given that there does not appear to be any negative effects on sea lions, birds, or fish, continuation of the independent monitoring aspect of the program is not necessary.

ACKNOWLEDGEMENTS

We wish to acknowledge and thank all those who cooperated and supported the conduct of this work, especially the staff of the Port of Gold Beach, the Port of Gold Beach Commissioners, and all of the Rogue River sport anglers that cooperated with us. Funds and logistical support were provided by CSA, NMFS, ODFW, Curry Anadromous Fishermen, and the Port of Gold Beach.

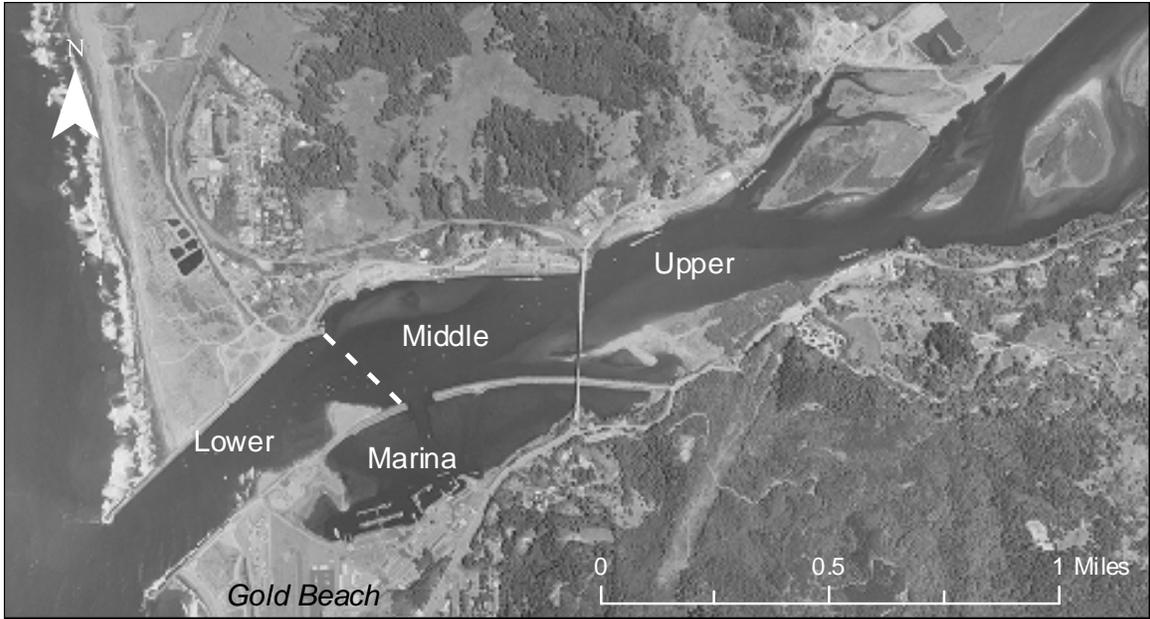


Figure 1. Overview of Rogue River Estuary Project Area (2005 orthoimagery) showing lower, middle, and upper estuary observation areas.

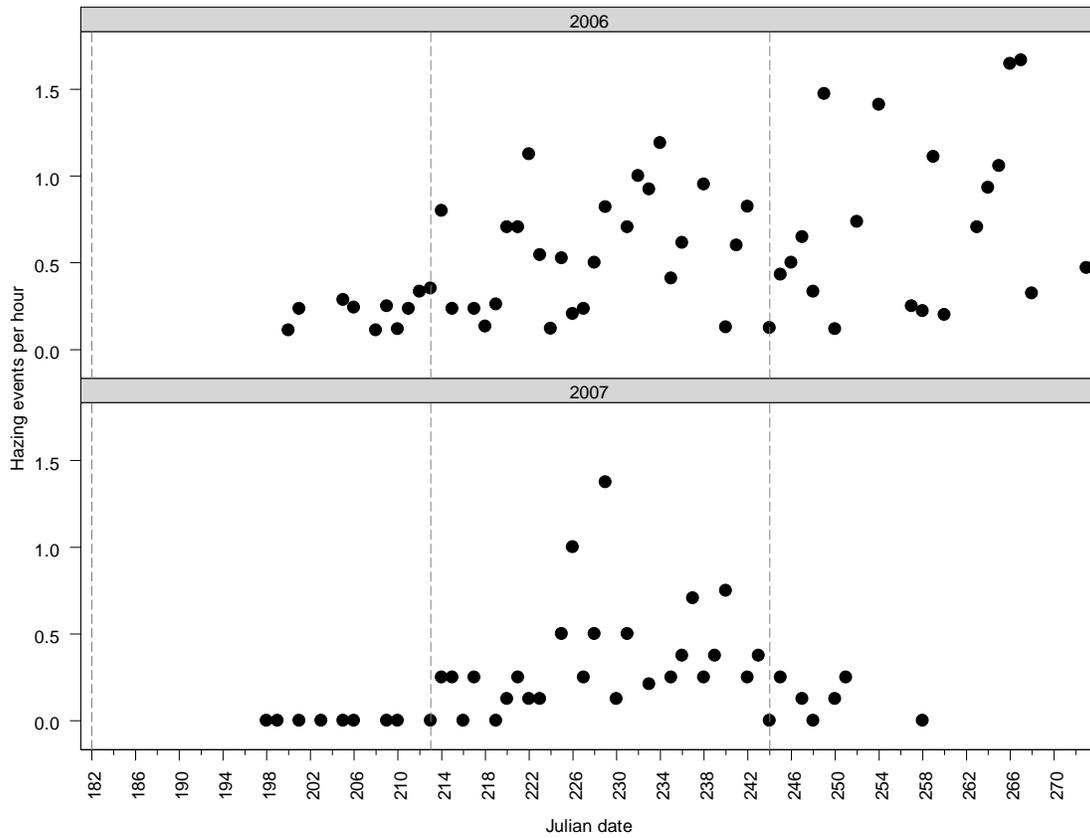


Figure 2. Frequency (events per hour effort) of boat-based hazing events targeting California sea lions at the Rogue River estuary, July-September, 2006-2007. (Months are indicated by dashed vertical lines: July 1=182, August 1=213, September 1=244, and October 1=274.)

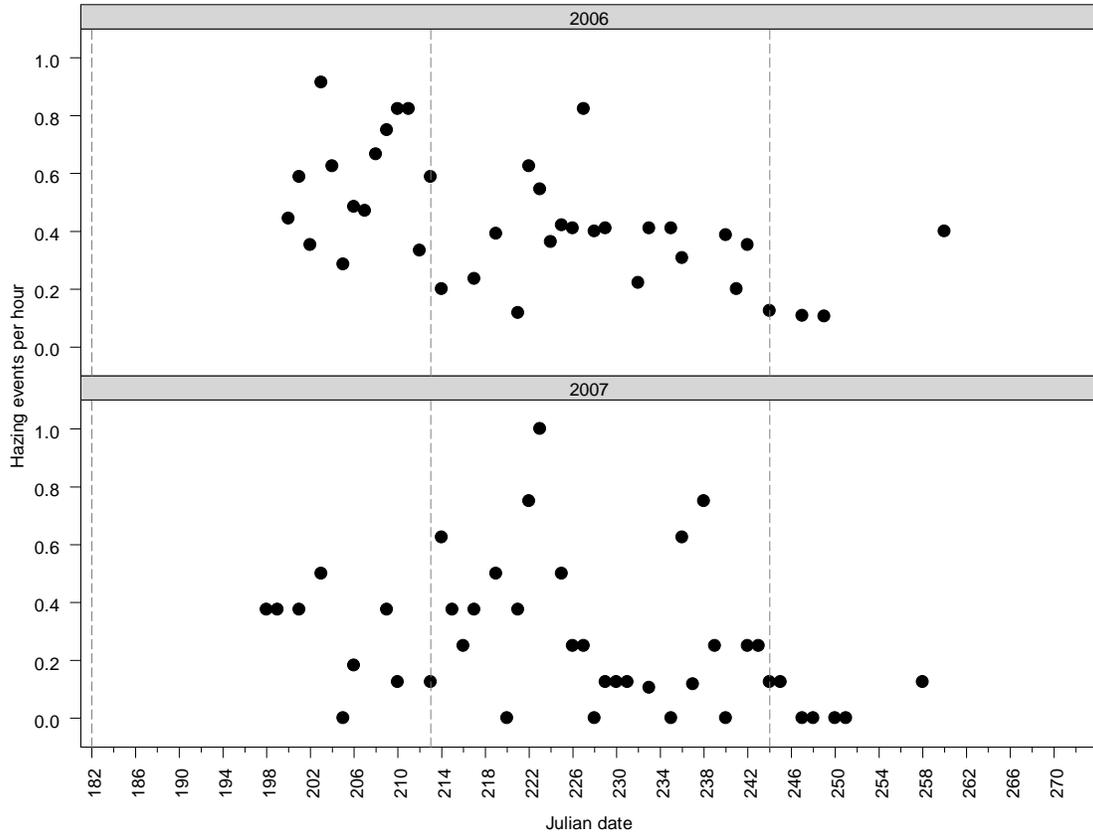


Figure 3. Frequency (events per hour effort) of boat-based hazing events targeting Steller sea lions at the Rogue River estuary, July-September, 2006-2007. (Months are indicated by dashed vertical lines: July 1=182, August 1=213, September 1=244, and October 1=274.)

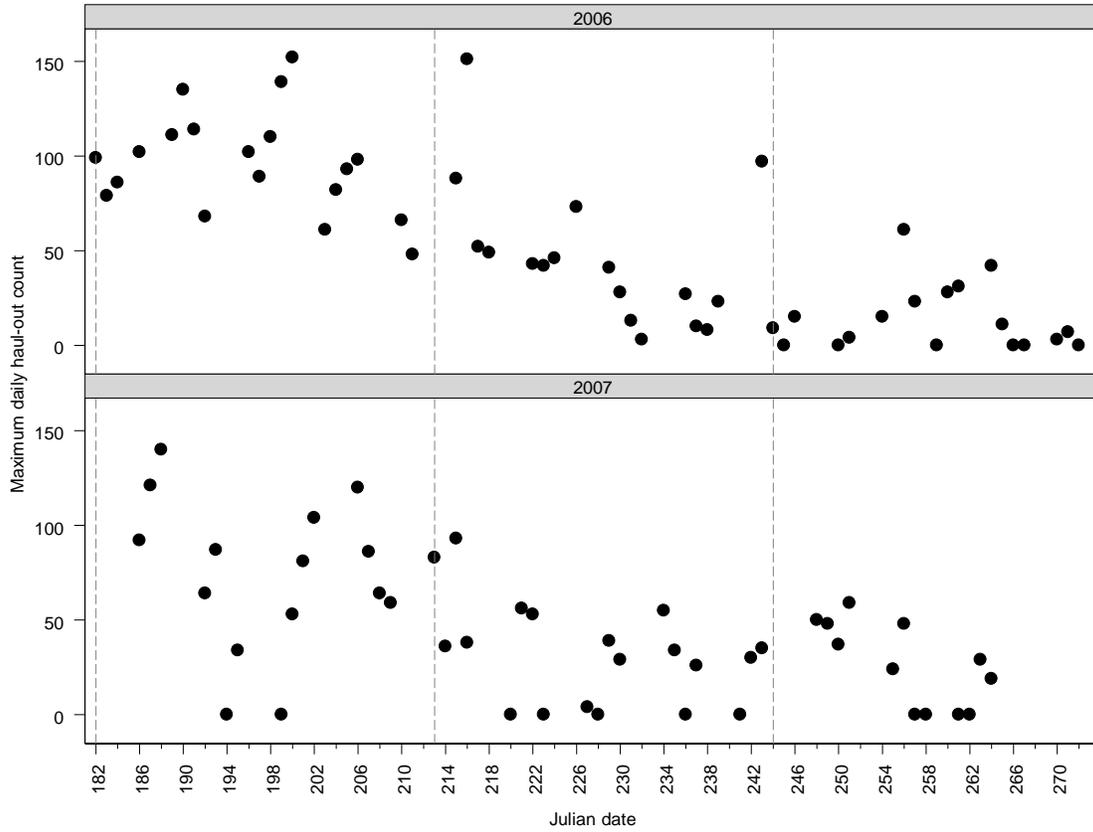


Figure 4. Maximum number of harbor seals hauled-out per day at the Rogue River estuary, July-September, 2006-2007 (based on early morning and late afternoon counts). (Months are indicated by dashed vertical lines: July 1=182, August 1=213, September 1=244, and October 1=274.)

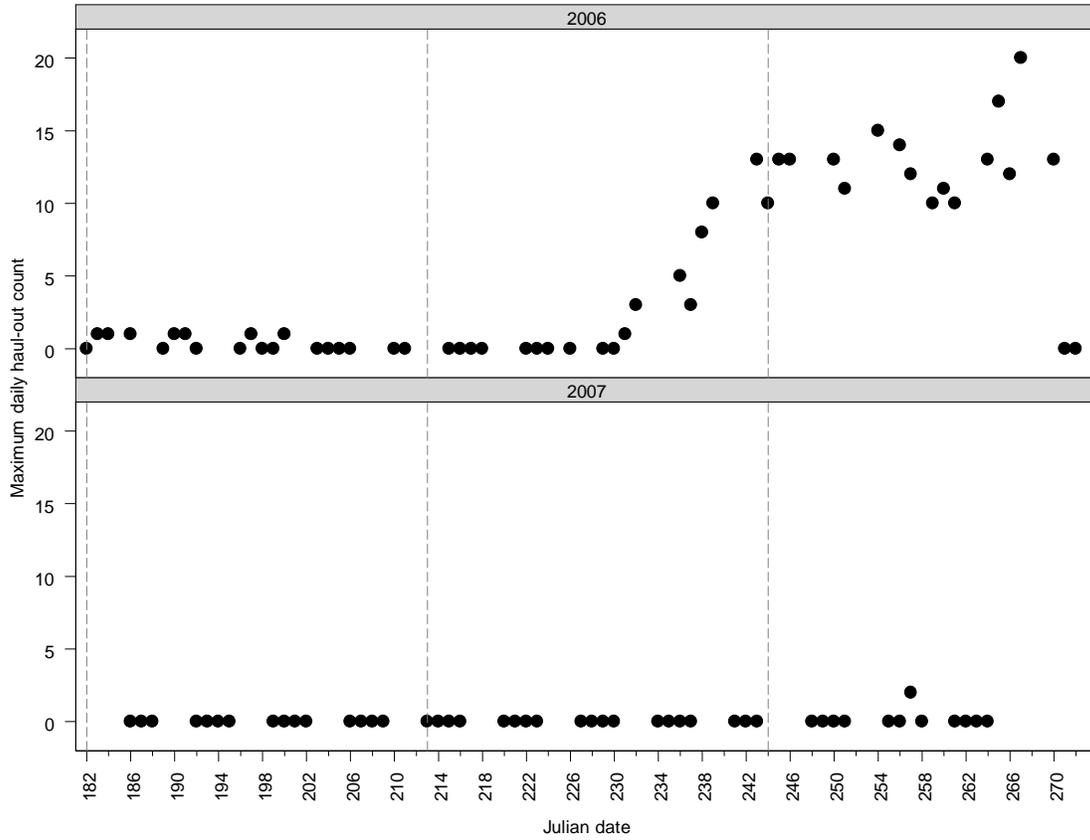


Figure 5. Maximum number of California sea lions hauled-out per day at the Rogue River estuary, July-September, 2006-2007 (based on early morning and late afternoon counts). (Months are indicated by dashed vertical lines: July 1=182, August 1=213, September 1=244, and October 1=274.)

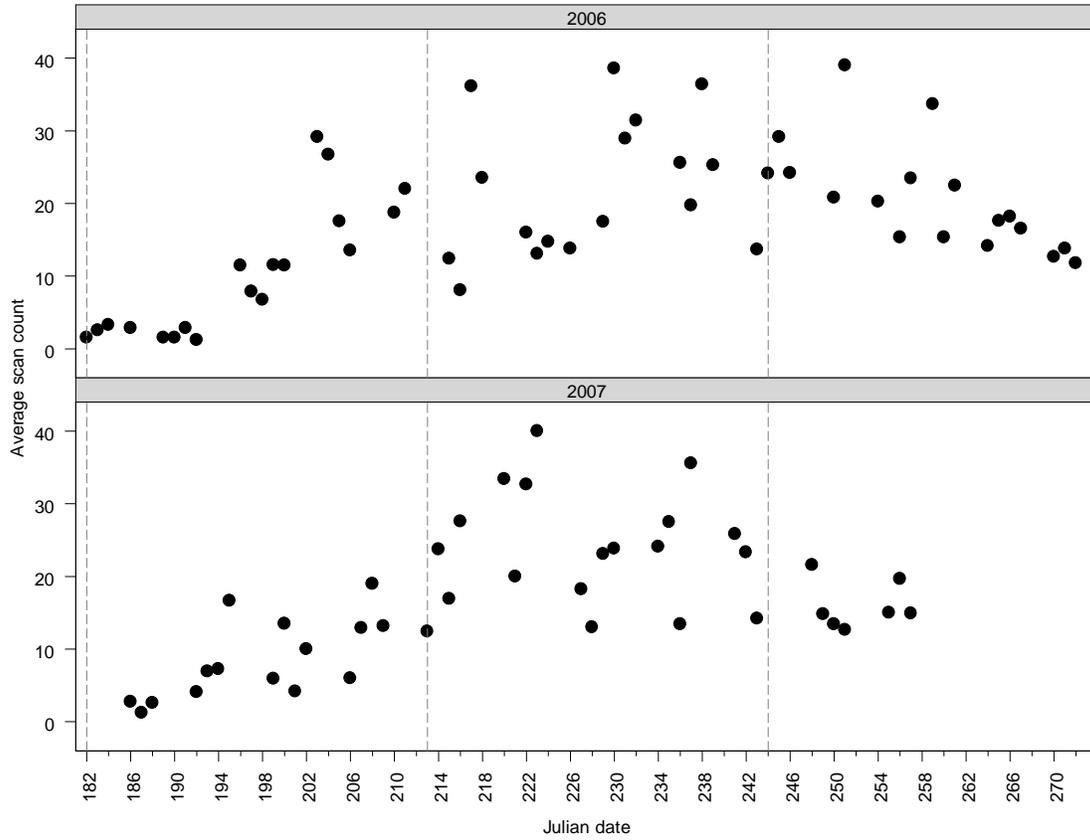


Figure 6. Average number of boats observed per scan-sample (n=15 per day, 2006; n=12 per day, 2007) at the Rogue River, July-September, 2006-2007. (Months are indicated by dashed vertical lines: July 1=182, August 1=213, September 1=244, and October 1=274.)

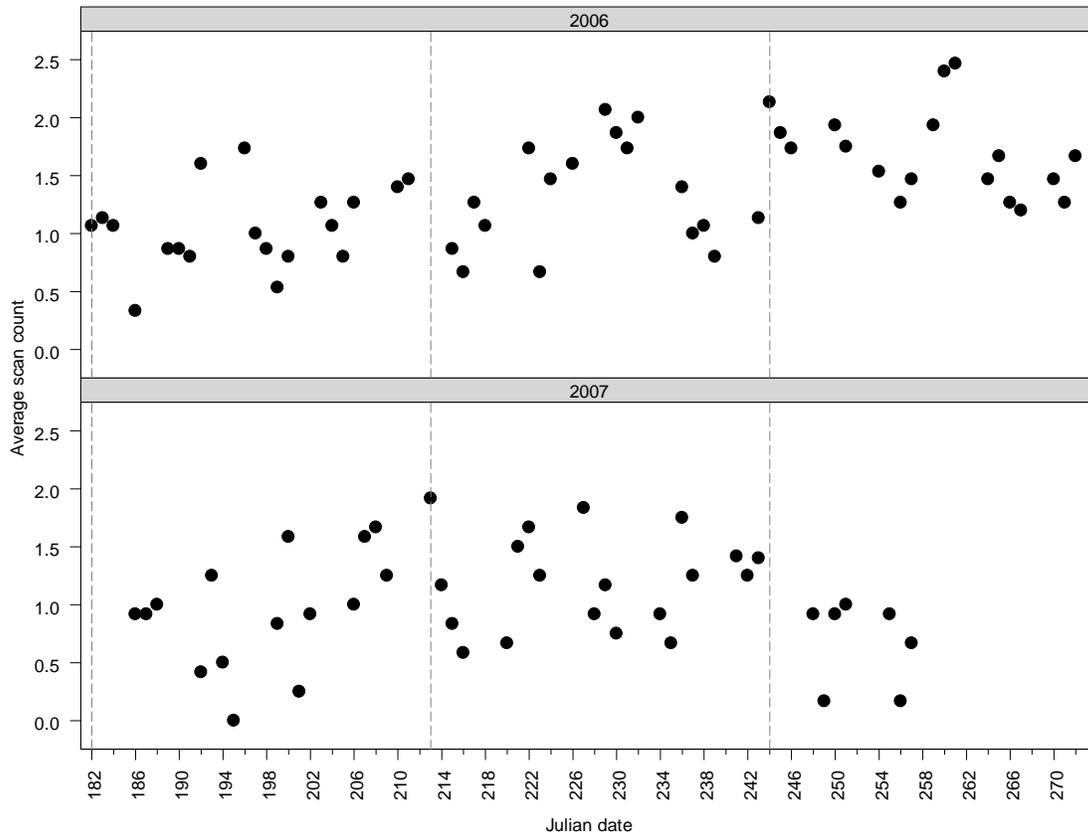
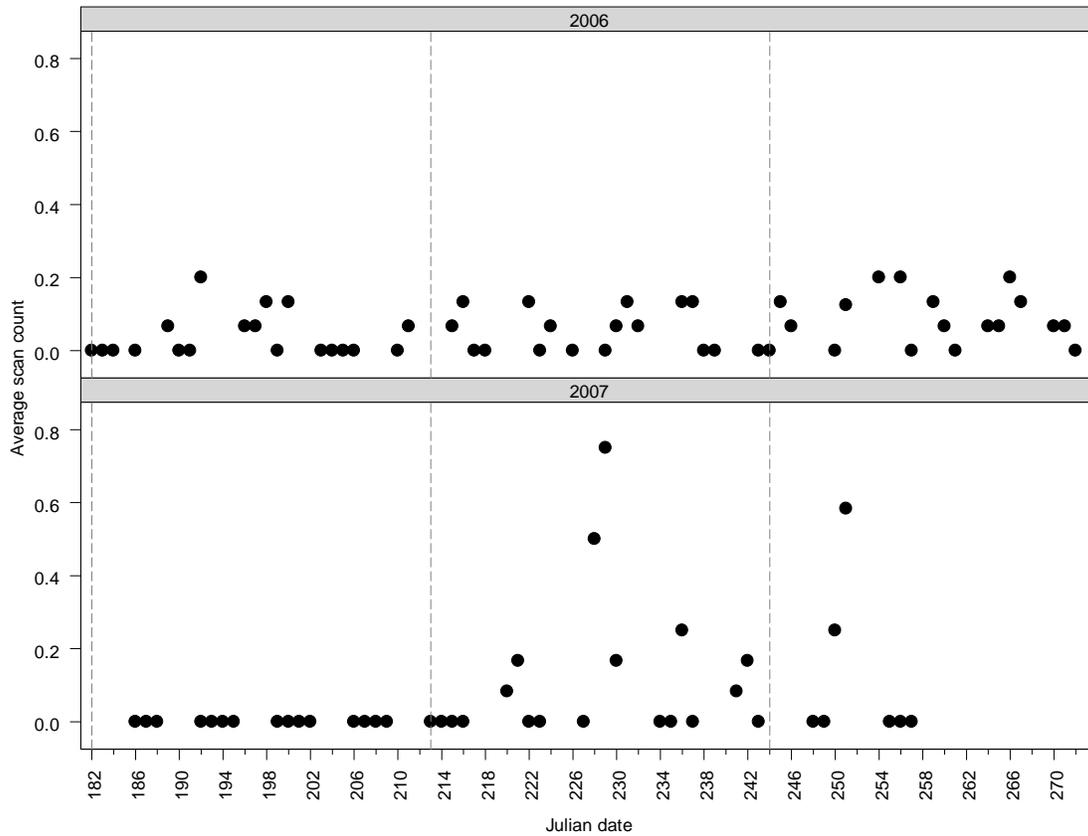


Figure 7. Average number of harbor seals observed per scan-sample (n=15 per day, 2006; n=12 per day, 2007) at the Rogue River, July-September, 2006-2007. (Months are indicated by dashed vertical lines: July 1=182, August 1=213, September 1=244, and October 1=274.)



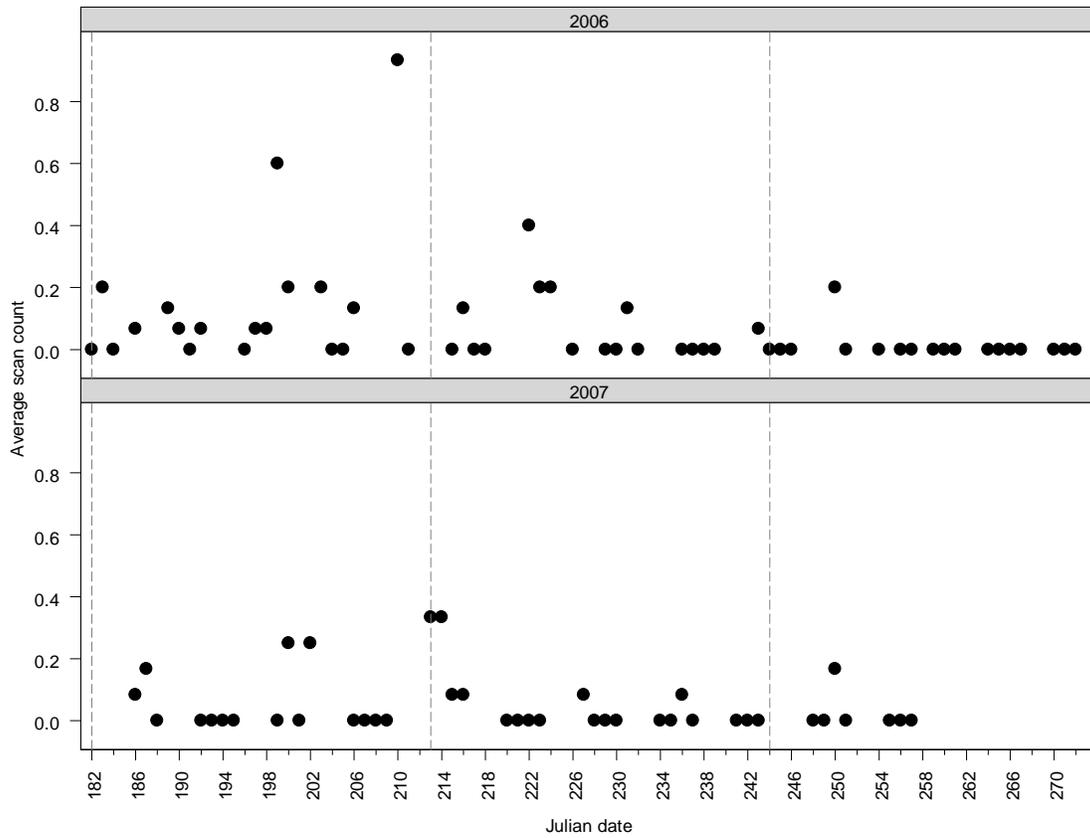


Figure 9. Average number of Steller sea lions observed per scan-sample (n=15 per day, 2006; n=12 per day, 2007) at the Rogue River, July-September, 2006-2007. (Months are indicated by dashed vertical lines: July 1=182, August 1=213, September 1=244, and October 1=274.)

Table 1. Summary of events and outcomes documented by ODFW shore-based observer at the Rogue River estuary, July-September, 2006-2007.

Event type / outcome	2006	2007
Boat catch (all fish species)	291	111
Landed / released (no interaction)	11	13
Landed / retained (no interaction)	277	98
Lost to pinniped(s) [all to CA sea lions]	3	0
Hazing	72	22
Pinniped(s) moved downriver/ocean/marina	58	10
Pinniped(s) moved upriver	7	4
Pinniped(s) movements unknown	7	8
Natural predation (i.e., free-swimming fish caught)	28	16
Salmon	15	11
Lamprey	9	0
Unknown	4	3
Salmon carcass	0	2
Total	391	149