

2018 Hazing and Dissuasion of Caspian Terns in the Lower Columbia Estuary: Season End Summary Report

Prepared for:

U.S. Army Corps of Engineers – Portland District
333 SW 1st Avenue, Portland, Oregon 97204

Prepared by:

Julie Harper¹ and Ken Collis²

¹Blue Leaf Environmental, Inc.
2301 W Dolarway Road, Suite 3, Ellensburg, Washington 98926

²Real Time Research
1000 SW Emkay Drive, Bend, Oregon 97702

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Introduction

As a component of a comprehensive strategy for salmonid (*Oncorhynchus* spp.) recovery in the Columbia Basin, the Caspian Tern Management Plan for the Columbia River Estuary has been developed to reduce the impacts of Caspian terns (*Hydroprogne caspia*) nesting on East Sand Island on the survival of juvenile salmonids listed under the Endangered Species Act (ESA; NOAA 2017). The management initiatives that are being implemented call for dispersal of nesting Caspian terns to alternative nest sites outside the Columbia Basin (USFWS 2005, 2006), while preventing Caspian terns from nesting elsewhere in the Columbia River estuary, specifically on Rice Island and other dredge material disposal sites in the upper estuary. The primary objective of this work is to assist the U.S. Army Corps of Engineers (Corps) in implementation of the management plan by monitoring Caspian tern use of the upper estuary and to dissuade Caspian terns from nesting at these sites.

Project Objective

As part of the Caspian Tern Management Plan, the objective of this project was to prevent Caspian terns from nesting on three dredge material disposal islands in the upper Columbia River estuary; Rice (Rkm 34), Miller Sands (Rkm 38), and Pillar Rock (Rkm 43) islands (Figure 1). This objective was achieved using boat and foot-based patrols, passive dissuasion (i.e., fencing, posts, rope, and flagging) and active hazing.

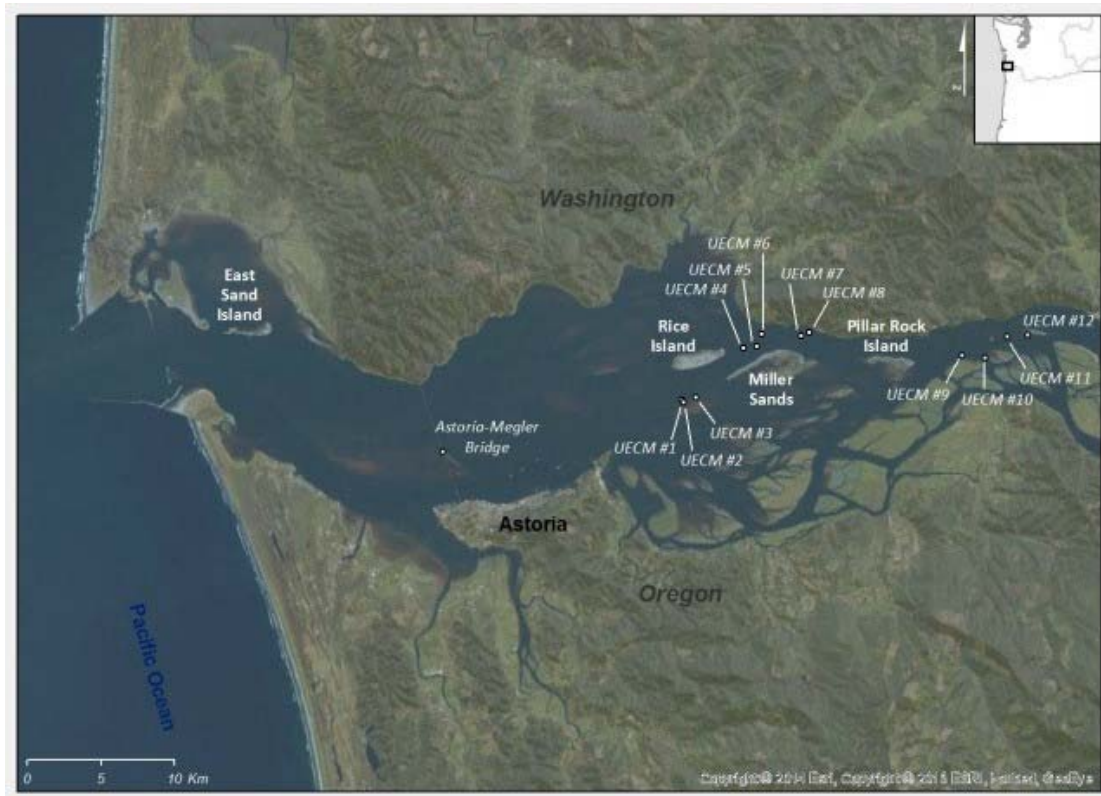


Figure 1. The locations of the dredge material disposal islands surveyed for Caspian terns depicted in relation to East Sand Island, the Astoria-Megler Bridge, and nearby channel markers in the Columbia River estuary.

Methods

Patrols and Active Nest Dissuasion

From mid-April through mid-July, boat-based patrols of Rice, Miller Sands, and Pillar Rock islands were conducted to document Caspian tern activity on or near each island, for a total of 53 patrol days (Figure 2). Each patrol was conducted by at least two monitors during daylight hours. Each site was visited at least once in the morning (after 8:00 AM), and once in the afternoon/evening (after 2:00 PM), unless prior authorization from the Corps was given to temporarily adjust patrol timing or if weather created unsafe boating conditions. During both monitoring sessions, each patrol day, Rice Island was also accessed and patrolled by foot to observe areas not visible by boat. During any incursion onto Rice Island, a designated route and access protocol (provided by the Corps) was followed to avoid disturbance to non-target species (e.g., ESA-listed streaked-horned larks). Patrols at Miller Sands and Pillar Rock islands, were limited to boat-based patrols (due to the presence of streaked-horned larks), unless nesting by Caspian terns at these sites was suspected and we were given explicit authorization from the Corps' Contracting Officers Representative (COR) to carry out nest dissuasion activities.

APRIL 2018						
M	T	W	T	F	S	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

MAY 2018						
M	T	W	T	F	S	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

JUNE 2018						
M	T	W	T	F	S	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

July 2018						
M	T	W	T	F	S	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Figure 2. Patrol days (green) conducted for Rice, Miller Sands, and Pillar Rock islands in 2018

During each survey, we collected data including, but not limited to: (1) patrol date; (2) start and end time of each patrol session; (3) areas in the estuary monitored between patrols; (4) weather conditions; (5) visibility conditions; (6) narrative of patrol activities per island; (7) number of Caspian terns observed in upland areas on each island and those roosting/foraging on or near the shoreline of each island; (8) number of Caspian terns attempting to nest on the island (i.e., Caspian terns in upland areas displaying nesting behaviors); (9) number of Caspian tern nests/scrapes counted and filled-in; (10) behavior of Caspian terns by island; (11) pertinent or unusual observations (e.g., disturbance events, presence of mammals or other

predators); (12) description of hazing or passive dissuasion actions implemented; (13) amount of passive dissuasion installed in square feet; (14) number of Caspian tern eggs depredated and collected/destroyed under permit; and (15) time, location, and number of Caspian terns seen on cameras, if applicable, as well as any unusual observations from camera footage.

If Caspian terns were observed exhibiting breeding behavior in upland areas at Rice, Miller Sands, and Pillar Rock islands, and they were within a designated "safe zone" identified and authorized to be surveyed on foot, they were first counted and then immediately hazed from the area. Following the initial hazing bout, we remained in the area to confirm the birds did not re-land nearby. If nests/scrapes were subsequently detected, they were enumerated and filled-in, and if Caspian tern eggs were present, they were collected and destroyed, under permit. If active Caspian tern nests were discovered during patrols, passive dissuasion installation and/or frequent or continuous active hazing was carried out to prevent nesting, if allowed. All activities on each of the three dredge disposal islands was coordinated with the Corps' COR and followed guidelines described in the Federal Migratory Bird Depredation Permit issued for this work.

Passive Dissuasion

In consultation with the Corps' COR, passive dissuasion was deployed, as needed, on Rice Island to prevent Caspian terns from nesting on the island. Installation methods generally followed those used elsewhere in the Columbia River Basin to successfully deter Caspian terns from colony formation (BRNW 2014, 2015, 2017; Collis et al. 2016, 2017). In brief, twisted polypropylene rope (0.25-inch) was attached to a 10-foot by 10-foot square array using 5-foot steel t-posts (or similar) driven into the ground. Four-foot-long pieces of industrial caution tape was inserted between the strands of rope at approximately 3-foot intervals and allowed to flutter in the wind as a visual and auditory deterrent to prospecting Caspian terns. In addition to passive dissuasion materials that existed on Rice Island prior to initiation of this work, 400 metal t-posts, 12 rolls (1,200 ft.) of 0.25-inch twisted polypropylene rope, and 12 rolls (1,000 ft.) of caution tape were purchased and transported to Rice Island for used on this project.

Results and Discussion

Miller Sands and Pillar Rock Islands

Miller Sands and Pillar Rock islands were patrolled by boat on all 53 patrol days. Almost no Caspian terns were observed in the upland areas of both islands and almost no nesting behavior was observed. During one patrol, the afternoon patrol on May 1, Caspian terns were observed in an upland area on the east end of Pillar Rock Island. Caspian terns were hazed twice by boat and were not observed in the area for the remaining patrol days. Both islands were patrolled by boat twice per day except for the last four patrol days when, due to increased Caspian tern nesting activity on Rice Island and lack of tern activity on Miller Sands and Pillar Rock islands, efforts were focused to patrol Rice Island in the evening.

Rice Island

Rice Island was patrolled by boat and by foot on all 53 patrol days. Boat and foot patrols were conducted twice per day except for one patrol day (May 27) where high winds created unsafe conditions and we were

forced to leave Rice Island before the afternoon patrol. During the last four patrol days, monitoring and hazing efforts were focused in the evening on Rice Island, due to an increase in Caspian tern nesting attempts and the expected benefit of hazing prospecting Caspian terns closer to sunset. Caspian terns were observed in the upland areas of the island on 16 of the 53 patrol days. Upland Caspian tern numbers observed during foot patrols ranged from 0 to 650 on April 27, with an average of 45 Caspian terns observed per patrol day (Table 1).

Table 1. Weekly Caspian tern (terns) numbers observed in upland areas during patrols of Rice Island in 2018, beginning the week of April 19-25 and ending the week of July 12-18.

	Week													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	
# of patrol days	4	4	7	7	7	6	5	3	3	2	2	2	1	53
Mean # of terns	89	329	17	1	0	1	0	0	103	144	0	0	0	45
Max # of terns	285	650	91	3	0	5	1	0	265	288	0	0	0	650
Min # of terns	0	25	0	0	0	0	0	0	9	0	0	0	0	0

Caspian tern nest scrapes were found in upland areas of Rice Island on 49 of the 53 patrol days. Scrape numbers ranged from 0 to 1,171 on May 4, with an average of 335 Caspian tern scrapes observed per patrol day. The total number of scrapes for the season was 17,731 (Table 2). All scrapes found were enumerated then filled in each patrol day. Whole Caspian tern eggs were found, collected, and destroyed, as per the Federal depredation permit, on four of the 53 patrol days. A total of 75 whole Caspian tern eggs were collected from Rice Island and destroyed (Table 2). A total of 107 Caspian tern eggs were found depredated by gulls during foot patrols, and the remnants were buried on site.

Table 2. Daily scrape numbers and Caspian tern eggs collected and destroyed on Rice Island in 2018.

Date	# Scrapes	# Eggs Collected
4/19/2018	0	0
4/21/2018	25	0
4/23/2018	47	0
4/25/2018	198	0
4/27/2018	477	0
4/29/2018	180	0
5/1/2018	545	0
5/2/2018	551	0
5/3/2018	660	1
5/4/2018	1171	0
5/5/2018	1069	0
5/6/2018	766	0
5/7/2018	643	0
5/8/2018	709	0
5/9/2018	157	0
5/10/2018	505	0
5/11/2018	442	0
5/12/2018	261	0
5/13/2018	175	0
5/14/2018	524	0
5/15/2018	584	0
5/16/2018	581	0
5/17/2018	391	0
5/18/2018	523	0
5/19/2018	417	0
5/20/2018	354	0
5/21/2018	403	0
5/22/2018	366	0
5/23/2018	305	0
5/24/2018	206	0
5/25/2018	363	0
5/26/2018	478	0
5/27/2018	420	0
5/28/2018	388	1
5/29/2018	332	0
5/31/2018	111	0
6/1/2018	95	0
6/2/2018	111	0
6/5/2018	30	0
6/6/2018	108	0
6/8/2018	114	0
6/10/2018	48	0

Date	# Scrapes	# Eggs Collected
6/12/2018	164	0
6/14/2018	233	0
6/17/2018	408	0
6/20/2018	351	14
6/23/2018	459	59
6/26/2018	193	0
6/29/2018	83	0
7/3/2018	0	0
7/7/2018	0	0
7/11/2018	0	0
7/13/2018	7	0
Total	17,731	75

A large amount of passive dissuasion had already been installed on the west end of Rice Island prior to our first patrol on April 19, either from previous years or activities conducted by the Corps in 2018 before our first patrol. The existing passive dissuasion consisted of a combination of silt fencing with rope between fence rows and posts (either t or u-posts) with rope. During our first patrol day, we hung flagging on 15,000 square feet of existing rope arrays. An additional 26,150 square feet of passive dissuasion (post, rope, and flagging) was installed throughout the season. All flagging was removed and disposed of by the final patrol day to prevent it from breaking off and entering the river during winter storms, and the existing fencing and posts with rope were left in place.

Four remotely accessible trail cameras were installed in the upland areas on the west end of Rice Island by May 12. Cameras were mounted on fabricated stands, using materials present on the island, and were moved depending on location of Caspian tern nesting activity. The cameras were installed to provide a better idea of Caspian tern numbers on the upland areas of Rice Island when we were not present. The time when Caspian terns first became visible on camera fluctuated from 16:30 to 21:45 and maximum numbers were recorded from 22:30 to 05:15. Estimated Caspian tern numbers visible on camera ranged from zero on May 16 to a maximum of 1,000 on May 24, for an average of 337 Caspian terns estimated in camera footage each night. No unusual activity was captured on the cameras.

The objective of this project, to prevent Caspian terns from nesting on Miller Sands, Pillar Rock, and Rice islands, was achieved. Although Caspian terns were still visible on camera images up until the final patrol, there were little to no scrapes found during the final four patrols, which spanned a ten-day period (Table 2). This indicates that Caspian terns observed on the trail cameras were most likely roosting on Rice Island and not attempting to nest.

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