CENWW-PPL **December 1, 2022**

Memorandum for the Record - Evaluation of Caspian tern predation deterrence operation within John Day Reservoir

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ENDANGERED SPECIES ACT CONSULTATION REFERENCE:

- 2020 CRS NMFS BiOp § 1.3.2.3, "The Action Agencies propose to increase the normal forebay operating range at John Day Dam by 2 feet during April 10 through June 1 to deter [delay] Caspian terns from nesting at the Blalock Islands Complex. The purpose of this operation is to reduce predation pressure on spring migrating, ESA-listed juvenile salmon and steelhead."
- CRSO EIS Appendix R, Mitigation, Monitoring, and Adaptive Management Part 1, Monitoring and Adaptive Management Plan, Section 2.2.3 Predator Disruption Operations (John Day).

BACKGROUND AND 2022 EVALUATION MANAGEMENT PURPOSE:

The Blalock Islands Complex Caspian tern colony has grown from an average of 57 breeding pairs (2005-2013) to a 2014-2021 average of 312 breeding pairs (BRNW 2021). As a result of the increase in nesting within the Blalock Islands Complex, predation on ESA-listed stocks by terns nesting within this island complex has at least partially offset benefits achieved by reduced predation by management efforts at other nesting locations such as Goose and Crescent islands.

This 2022 monitoring effort evaluates the efficacy of the 2022 operation to deter [delay] Caspian terns from nesting on submergible low-lying nesting habitat within the Blalock Islands Complex in order to reduce predation on ESA-listed juvenile steelhead and yearling Chinook in the John Day reservoir region (i.e., nesting habitat below a water surface elevation of 268' as measured at the JDA forebay) as set forth in the CRS EIS and 2020 CRS NMFS BiOp. No terns were photographed nesting in the Blalock Complex during the 2021 or 2022 evaluations.

METHODS

The Corps conducted monitoring through use of aerial surveys and review of imagery. The Civil Air Patrol via the U.S. Air Force Auxillary (CAP-AFAUX), collected four sets of imagery from April to July 2022. Imagery capture was typically at approximately 1,000ft above ground level and collected with a handheld digital camera from the CAP-AFAUX plane (Cessna 186 or Cessna 206). Corps biologists subsequently processed and reviewed the imagery to provide the following results.

Additional monitoring of the Columbia River basin was funded by Bonneville Power Administration (BPA) and conducted by Real Time Research and Oregon State University (collectively referred to as Bird Research Northwest, BRNW). Reporting by BRNW is separate from this document and is anticipated to be available at http://www.birdresearchnw.org/ once released by BPA and BRNW.

RESULTS

John Day Dam Operations

To deter [delay] Caspian terns from nesting on low-lying habitat during the steelhead and yearling Chinook outmigration, FCRPS operations in 2022 were set up to hold the John Day reservoir elevation between 264.5-266.5 feet during the period of April 10 - June 1 (or as feasible based on river flows) (2020 CRS NMFS BiOp) (Figure 1).

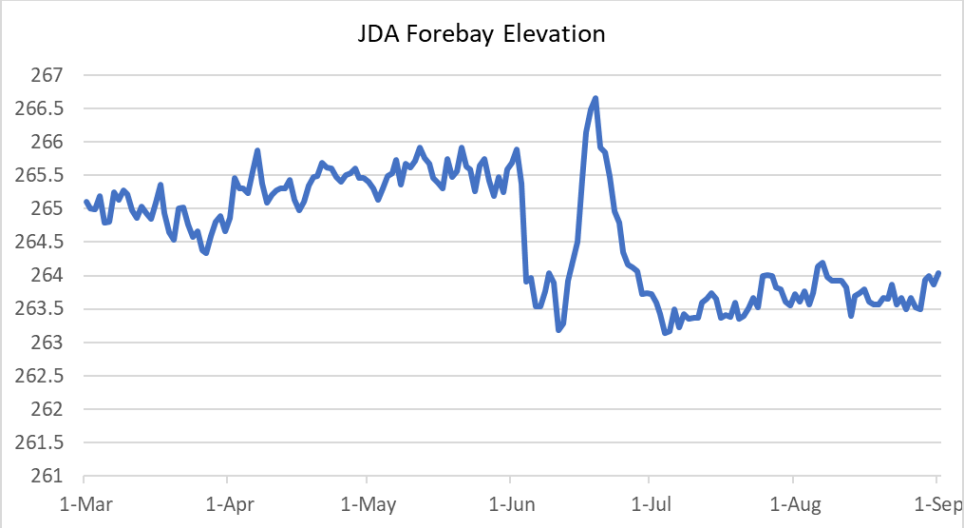

Figure 1. John Day Dam operations. Extracted from DB Query on 1 November 2022 for station JDA.Elev-Forebay.Ave.~1Day.1Day.CBT-REV[ft].

Survey Locations and Dates

The CAP-AFAUX flew over the John Day and McNary Reservoirs to capture imagery of nesting Caspian terns on four events on 24 May, 15 June, 05 July and 29 July 2022.

Primary survey targets included islands in the John Day Reservoir including Brown's Island, Miller Rocks upstream of Miller Island, John Day Dam area including Preacher Island, and islands in the McNary Reservoir including islands in vicinity of Three Mile Canyon, Blalock Island Complex, outcroppings in McNary Dam forebay, Crescent Island, Badger Island, Foundation Island, and the Finley Islands. CAP-AFAUX observed other areas during flights and photographed potential nesting if potential for Caspian terns was observed by flight crews.

Figure 2. Geographic reach of surveys in the John Day and McNary Reservoirs during the 2022 Caspian tern nesting season extended from Browns Island (just downstream of Miller Rocks) to Foundation Island.

Caspian Tern Survey Results

Location	5/24/2022	6/15/2022	7/5/2022	7/29/2022
	Nests	Nests	Nests	Nests
Brown's Island	0	0	0	0
Island West of Miller Island	0	0	0	0
Islets North of Miller Island	0	0	0	0
Miller Rocks	0	0	0	0
JDA Preacher Island	0	0	0	0
Three Mile Islands	0	0	0	0
Blalock Island Complex*	0	0	0	0
Straight Six	0	0	0	0
Long, Middle Islands	0	0	0	0
South Island	0	0	0	0
Unnamed Island	0	0	0	0
Rock Island	0	0	0	0
Big Blalock	0	0	0	0
Little Blalock	0	0	0	0
Anvil Island	0	0	0	0
Sand Island	0	0	0	0
Blalocks Slough	-	-	0	0
McNary Forebay	0	0	0	0
Crescent Island	203	109	63	2
Badger Island*	167	151	*62*	*0*
Interior Colony	0	0	0	0
Shoreline Colony	167	151	62	0
Remainder of Island	0	0	0	0
Walla Walla Delta	0	0	0	0
Finley Islands (MCN Reservoir)	0	0	0	0
Foundation Island	0	0	0	0
Burbank Slough	-	-	-	0

Figure 3. Summary of Caspian tern nesting observations via aerial imagery collected by Civil Air Patrol - Air Force Auxiliary (CAP-AFAUX) during the spring of 2022. Dashes (-) indicate that Caspian terns were not observed in the field and CAP-AFAUX did not collect imagery of the location.

Blalock Island Complex

Some limited numbers of Caspian terns, Double-crested cormorants, and gulls were observed loafing around Rock Island following the lowering of the reservoir water levels to the historical forebay operating range (e.g., Figure 4). However, no nesting attempts were observed in the CAP-AFAUX photography.

Figure 4. Rock Island in the Blalock Island Complex on 29 July 2022. Shaded areas point out small groups of loafing terns. Photo taken by the Civil Air Patrol, Air Force Auxiliary (CAP-AFAUX).

Crescent Island

- There was a large presence of nesting terns at the historic nesting area May through early July (Figure 5).
- The surveillance in late July showed two nesting terns left in the nesting area on Crescent Island (Figure 6).

Figure 5. Crescent Island - 2022 – Approximately 200 Caspian tern nesting pairs were observed in the historic nesting area during the spring nesting season. Photo taken by the Civil Air Patrol, Air Force Auxiliary (CAP-AFAUX).

Figure 6. Crescent Island – 29 July 2022 – Two Caspian terns nesting were observed in the historic nesting area. Photo taken by the Civil Air Patrol, Air Force Auxiliary (CAP-AFAUX).

Foundation Island

- During the surveillance on 5 July 2022, approximately 8 terns were photographed loafing at the water's edge on the point of Foundation Island (Figure 7).

Figure 7. Foundation Island in McNary Reservoir on 5 July 2022 with Caspian terns on the upstream gravel bar. Photo taken by the Civil Air Patrol, Air Force Auxiliary (CAP-AFAUX).

Badger Island

- An additional substantive nesting colony within the John Day and McNary Reservoirs during the 2022 spring nesting season occurred at Badger Island (Figure 8). In 2021, Caspian terns nested at two locations on the island, at a site along the shoreline and at a site on the interior of the island. In 2022, several terns were present at the shoreline location (Figure 9), but no terns were photographed at the interior location.

Figure 8. Caspian tern nesting pairs at Badger Island during the 2021 nesting season.

Figure 9. Badger Island in McNary Reservoir - Caspian terns nested along the shoreline. Photo taken by the Civil Air Patrol, Air Force Auxiliary (CAP-AFAUX).

BLALOCK ISLAND NESTING HABITAT AREA

Caspian tern nesting habitat during the spring 2022 operation was mostly inundated by the raised forebay measure as anticipated in the CRS EIS and 2020 CRS NMFS BiOp. While some limited low-lying habitat was available at times, low-lying habitat was generally not available during the April 10 through June 1 period. For example, the focal low-lying islands of South, Middle, and Long Islands (Figure 10), where the majority of recent historical nesting has occurred, was underwater during the April 10 through June 1 period (Figure 11) and just above the surface on 29 July (Figure 12).

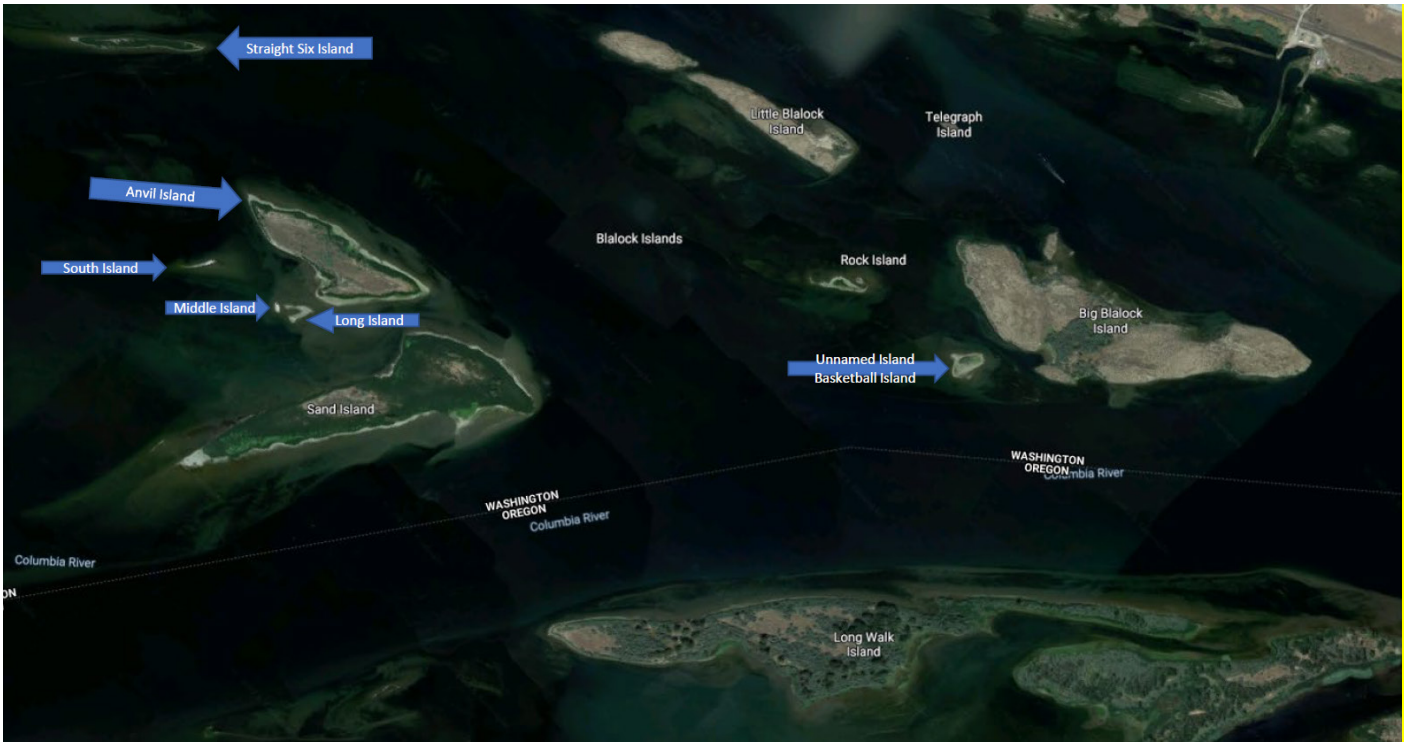

Figure 10. Blalock Island Complex showing names of smaller islands throughout the complex.

Figure 4. Blalock Island Complex on 24 May 2022. Anvil and Sand Islands are pictured above and the low-lying South, Middle, and Long Islands between Anvil and Sand Islands are underwater. Photo taken by the Civil Air Patrol, Air Force Auxiliary (CAP-AFAUX).

Figure 5. South, Middle, Long, and Anvil Islands(left) and Sand Island (right) within the Blalock Island Complex on 29 July 2022. Photo taken by the Civil Air Patrol, Air Force Auxiliary (CAP-AFAUX).

HISTORICAL REFERENCE FIGURES

Colony	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Goose Is. (Potholes Reservoir)	282	293	487	416	422	463	340	159	2	0	0	0	0	6	22
Crescent Is. (Columbia River)	355	388	349	375	419	422	393	474	0	0	0	0	0	0	1
Blalock Islands (Columbia River)	43	104	79	136	20	6	26	45	677	483	449	313	379	150	0
Badger Is. (Columbia River)	0	0	0	0	33	60	0	0	0	0	41	8	0	0	231
Twinning Is. (Banks Lake)	31	27	61	34	19	22	13	67	64	6	0	0	0	0	0
Harper Is. (Sprague Lake)	0	11	4	4	4	30	1	8	10	3	92	79	18	0	85
North Rocks and Shoal Is. (Lenore Lake)	0	0	0	0	0	0	0	0	0	0	123	91	48	53	61
Total	**711**	**823**	**980**	**965**	**917**	**1003**	**773**	**755**	**769**	**675**	**705**	**491**	**445**	**209**	**400**

Figure 6. Sizes of Caspian tern breeding colonies (number of breeding pairs) at both managed and unmanaged colonies in the Columbia Plateau region prior to (2007-2013) and during (2014-2021) management. Taken from Table 1 in BRNW 2021.

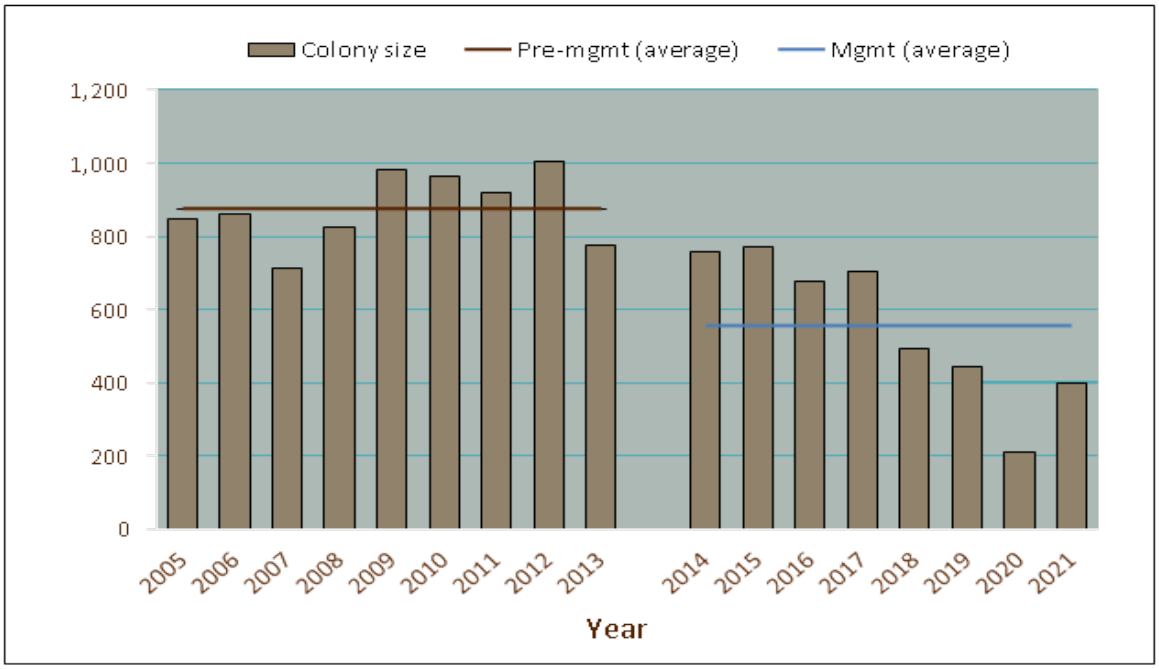

Figure 14. Total numbers of Caspian tern breeding pairs at all known colonies in the Columbia Plateau region during 2005-2021. Also, provided is the average number of breeding pairs of Caspian terns prior to tern management in the Columbia Plateau region (2005-2013) and during (2014-2021) tern management in the region. Taken from Figure 5 in BRNW 2022.

LITERATURE CITED

BRNW, 2022. *Avian Predation in the Columbia River Basin: 2021 Final Annual Report.* Submitted to Bonneville Power Administration (Contract No. 60846, Project No. 1997-024-00) and Grant County Public Utility District and the Priest Rapids Coordinating Committee (Agreement No. HFA 601-3H). Submitted by Real Time Research, Inc., and Oregon State University on 31 March 2022.

NMFS, 2020. 2020 CRS BiOp