Pacific Seabird Group

DEDICATED TO THE STUDY AND CONSERVATION OF PACIFIC SEABIRDS AND THEIR ENVIRONMENT

**PSG Website: www.pacificseabirdgroup.org**

**Jo Smith**
**Chair**
Smithers, British Columbia
Chair@PacificSeabirdGroup.org

**Kathy Kuletz**
**Chair-Elect**
Anchorage, Alaska
ProgramChair@PacificSeabirdGroup.org

**Stanley Senner**
**Vice-Chair for Conservation**
Portland, Oregon
Conservation@PacificSeabirdGroup.org

8 August 2014

Sondra Ruckwardt
U.S. Army Corps of Engineer District, Portland
Attn: CENWP-PM-E/Double-crested Cormorant draft EIS
P.O. Box 2946
Portland, Oregon 97208-2946

Dear Ms. Ruckwardt:

This letter is in response to the draft environmental impact statement (draft EIS) from the Army Corps of Engineers on the *Double-crested Cormorant Management Plan to Reduce Predation of Juvenile Salmonids in the Columbia River Estuary*. The Pacific Seabird Group (PSG) does not support the Army Corps' Preferred Alternative C because: (1) the science supporting the 3.6 percent survival gap is incomplete and the benefits to salmon smolt survival by reducing cormorant predation have not been determined, (2) non-lethal control has not been fully tested and evaluated prior to lethal control, and (3) the estimated impact of the preferred alternative on the western North American population of Double-crested Cormorants is a serious concern.

The PSG is an international, non-profit organization that was founded in 1972 to promote the knowledge, study, and conservation of Pacific seabirds. It has a membership drawn from 14 nations, including Australia, Canada, China, Japan, Mexico, New Zealand, Peru, Russia, and the USA. PSG's members include biologists and scientists who have research interests in Pacific seabirds, government officials who manage seabird refuges and populations, and representatives of nongovernmental

organizations and individuals, all of whom are interested in the science and conservation of marine birds.

In its Preferred Alternative C, the Army Corps and cooperating agencies propose to shoot 15,995 (hereafter, "about 16,000") Double-crested Cormorants over a 2-4 year period to reduce the size of the East Sand Island Double-crested Cormorant colony from a three-year average of 13,400 pairs to 5,380-5,939 pairs (hereafter, "about 5,600 pairs"). The lethal control would be coupled with oiling of some eggs, reducing the habitat available on East Sand Island for nesting cormorants in the future, and hazing of prospective nesters at East Sand Island and elsewhere in the estuary.

1) Supporting Science: Survival Gap and Benefits Analysis

According to the draft EIS, reducing the size of the Double-crested Cormorant colony in the Columbia River estuary to about 5,600 pairs is justified by a management objective to eliminate a steelhead smolt "survival gap" of 3.6 percent. The estimated survival gap is the difference between the average annual total consumption rate of smolts by cormorants from two arbitrarily selected time periods: a base period, 1983-2002, and the "current period," 2003-2009 (Appendix D).

The analysis to support this management objective was not subject to external peer review (G. Fredricks, pers. comm., National Marine Fisheries Service), and appears to be based on incomplete scientific information: 1) There are no measurements of cormorant diet or predation rates in the Columbia River estuary prior to 1998 (four years before the start of the current period and near the end of the base period); 2) Data for the number of cormorants nesting or foraging in the estuary prior to 1997 are limited; and 3) In the analysis that generated the value of 3.6 percent for the survival gap, the only factors varied in the model were numbers of breeding cormorants and numbers of smolts entering the estuary[1]. Inter-annual predation rates on salmon vary by an order of magnitude and are not independent of environmental conditions. For example, the volume of freshwater outflow in the Columbia River has a strong influence on salmonid predation rates by cormorants (e.g., Lyons et al. 2014): when freshwater outflow is low, saltwater advances farther into the estuary, bringing alternative marine prey for cormorants (e.g., anchovies, smelt, sardines, herring). Thus, the survival gap analysis should address the inter-annual variability in environmental conditions that influences predation rates and capture the uncertainty due to lack of

[1] The number of smolts entering the estuary is extremely challenging to estimate, and which in this case is based on a pre-season forecast without confirmation from empirical data collected in the estuary or measures of confidence.

data for diet and population numbers. With a more sophisticated analysis, the estimated survival gap may be significantly different (e.g., lower) than calculated in the DEIS, changing the management objective and magnitude of lethal control potentially required.

In addition to the incomplete analysis mentioned above, the Army Corps and its agency partners do not provide statistical, peer-reviewed evidence that reducing the number of cormorants will increase salmon smolt survival in the estuary. On the mid-Columbia River, a 3-year study by the University of Washington with the Chelan County Public Utitlity District found that thousands of avian predators (including Double-crested Cormorants) had a <1% effect on salmon smolt survival and the avian predators consumed significant quantities of northern pikeminnow, a native, piscivorous predator of juvenile salmon (Wiese et al., 2008). Although the pikeminnow is not a predator on juvenile salmonids in the estuary environment, Wiese et al. (2008) raise the issue of compensatory mortality, which the draft EIS (Chapter 4 – page 6; Appendix D – page 6) largely dismisses as not being relevant to the issue at hand. We conclude, however, that understanding the degree to which reductions in avian predation might be compensated for by other salmonid mortality factors is highly relevant to identifying appropriate management objectives and evaluating the actual benefit of those objectives (e.g., Lyons 2010).

The draft EIS proposes to reduce the East Sand Island cormorant colony to about 5,600 pairs as an all or nothing proposition, but what are the benefits for enhancing salmonid population growth over time under a range of target levels for cormorant control? What are the incremental gains and losses of reducing the cormorant colony size by different amounts, and how do these compare to, or interact with, other factors that influence smolt survival?

There are multiple factors that influence the survival of Pacific salmon smolts including body condition (length and weight), availability of cover or habitat protection from predators, downstream timing, prey availability in the estuary, predator abundance, environmental conditions in the estuary, and the presence of high-head dams on the Columbia River (Zabel and Williams 2002, Williams 2008). Wiese et al. (2008) conclude that "identifying the strength of ecosystem interactions....represents a top priority when attempting to manage the abundance of a particular ecosystem constituent - and that the consequences of a single-species view may be counterintuitive, and potentially counterproductive."

2) Non-lethal Means of Reducing Cormorant Predation

Our second comment is that non-lethal methods have not been fully explored or tested. The Pacific Flyway Council's (2012) management framework for Double-crested Cormorants recommends that non-lethal measures be implemented first and the effects of these actions assessed before lethal controls of cormorants are implemented. The Council's guidelines were developed by member agencies, including the US Fish and Wildlife Service and several other agencies that cooperated in the preparation of the draft EIS. The draft EIS, as well as subsequent outreach materials and media accounts, would lead readers to conclude that the Army Corps has fully implemented and assessed non-lethal means of reducing the size of the East Sand Island cormorant colony prior to a lethal control proposal but this is not the case.

A non-lethal management approach intending to disperse some portion of the East Sand Island cormorant colony (e.g., Alternative B) would rely on three techniques: (i) habitat restriction and disturbance to limit the number of cormorants nesting on East Sand Island, (ii) understanding prospecting behavior and identifying prospecting locations, and (iii) hazing of cormorants away from any unacceptable prospecting locations, such as alternative sites in the Columbia River estuary. With support from the Army Corps, recent experimental work on Double-crested Cormorants suggests that success in each of these techniques is feasible and certainly has not been demonstrated to be infeasible. Comments on these three non-lethal techniques are listed below:

*i) Habitat Restriction and Disturbance*: Experiments conducted during 2011-2013 used privacy fences, nest destruction, and hazing to examine how cormorants might respond to this disturbance with the result that cormorants temporarily left the island and returned to nest in undisturbed areas. In order to evaluate how this type of disturbance might be used to reduce the number of nesting birds, additional reductions in habitat, and additional NEPA compliance, will be required. There is every reason to expect that habitat restriction can successfully reduce the size of the colony using the non-lethal methods in the 2011-2013 experiments and the draft EIS presumes this in Alternative C (i.e., the estimated lethal control is based in part on a scenario where the island carrying capacity is incrementally reduced during Phase I of the proposed management). Thus, the next step is to implement and evaluate the effectiveness of this management strategy before considering lethal control.

*ii) Understanding Prospecting Behavior and Identifying Prospecting Locations*: Tracking experiments conducted by Oregon State University during 2012-2013 indicated that cormorants that leave East Sand Island do not randomly explore alternative habitats. Cormorants showed a predictable dispersal pattern: frequent visitation of active or

historical colony sites, repeated use of communal roosts, and greater use of the lower Columbia River and estuary and select areas of coastal Washington. Tracking experiments advanced our understanding of cormorant prospecting behavior and identified specific sites that cormorants might use for nesting, developed a robust technique to identify other possible sites based on their behavior. Tracking experiments can address some of the concerns about using a non-lethal approach; for example, future tracking studies can study dispersal after habitat restriction and disturbance. Currently, there is little evidence that the Oregon coast would be substantially used by East Sand Island cormorants.

*iii) Hazing at Undesirable Dispersal Locations*: The draft EIS does not discuss any experiments that have been conducted to evaluate the difficulty of hazing cormorants away from possible dispersal sites. Based on the success of hazing at preventing nesting in select areas of the East Sand Island colony, where cormorants have an individual history of nesting and the large colony provided an immense social attraction, one can reasonably conclude that hazing at prospecting sites would be comparatively easy. Additionally, double-crested cormorants are well known to be susceptible to human disturbance—a factor known or suspected to have caused abandonment of multiple colonies in both coastal Washington and British Columbia. Consequently, there is reason to think hazing at undesirable dispersal locations could successfully prevent colony initiation or growth. There is no empirical evidence to suggest hazing would not work in this capacity.

To summarize this section, the Army Corps and its partners have neither implemented nor tested a full-scale non-lethal approach to reducing the presence of Double-crested Cormorants on East Sand Island. To choose Preferred Alternative C before doing so would be inconsistent with the Pacific Flyway Council guidelines.

3) Impact on the Double-crested Cormorant Population

Finally, we note that the impact of lethal control to the western population of Double-crested Cormorants is estimated to be significant. In 2013, about 29,800 Double-crested Cormorants (~ 14,900 pairs) nested on East Sand Island, which is now the world's largest colony for this species. In 2014, nesting data are still being analyzed and there is no reason to think that fewer cormorants were present. According to Alternative C, the Army Corps wants to reach a target of 5,600 nesting pairs at East Sand Island, so it may be necessary to actually kill 18,600 cormorants (9,300 pairs), not 16,000--this is 60 percent of the world's largest Double-crested Cormorant colony.

Lethal control has several problems that need to be mitigated or accounted for, including disturbance and incidental mortality. Lethal control (shooting and salvaging dead birds), whether by day or night, will result in considerable disturbance to all birds nesting on the island and may cause additional egg loss, chick mortality, or abandonment of the colony by cormorants or other species. The East Sand Island colony contains the largest Brandt's Cormorant colony in Oregon (about 1,500 pairs) and one could expect disturbance and accidental death from misidentification to this species. Additionally, if cormorants are shot away from the East Side Island colony, their breeding status will be unknown (e.g., non-breeding individuals), meaning that more cormorants may be shot than necessary to reach the Army Corps' reduction target.

Of great concern is the unknown impact to the western population of this species. In 2009, the entire western North America population of Double-crested Cormorants was estimated to be 64,200 individuals (31,200 breeding pairs), of which about 39 percent nested at the East Sand Island colony. A reduction of 16,000 to 18,600 cormorants at East Sand Island would reduce the western population by more than 25 percent at a time when many colonies on the Washington and British Columbia coasts have declined. Some major colonies, for example, Mullet Island in the Salton Sea, have been abandoned and in British Columbia, the Double-crested Cormorant is Blue listed (watch list) because of concern about its status (http://a100.gov.bc.ca/pub/eswp/search.do;jsessionid=VhCmT0VLNc51p9vQZ71G0BQ2G1vRZKbW00gf63c23Ym1jQfwNDG6!234374013).

The current size of the western North American population of Double-crested Cormorants is at least an order of magnitude below historical levels. The selection of the estimated cormorant population in 1990 as a desired, sustainable level is wholly arbitrary and represents a "shifting baseline" (*sensu* Pauly 1995).

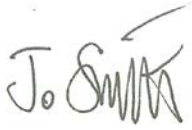
The PSG understands the importance of protecting Pacific salmon species for the health of commercial and recreational fisheries, ecological integrity of the Columbia River and Pacific Ocean ecosystem, and cultural heritage of Pacific Northwest tribes and communities. However, the purposeful reduction of more than 25 percent of the entire western population of a native, North American, non-game bird is an extreme measure that currently cannot be justified by relevant national policy (e.g., Pacific Flyway Council), available science, or best practices in ecosystem-based management.

In conclusion, the PSG urges the Army Corps and its cooperators to choose Alternative A, "no action", at this time and to revisit its approach to managing avian predation and other sources of mortality to salmonid smolts in the Columbia River basin. Management

of Double-crested Cormorants and other avian predators should be considered and addressed on a range-wide, ecosystem scale, as it is clear that the problems related to salmon smolt survival and the impacts of the Army Corps' proposed solutions extend far beyond the Columbia River estuary.

We appreciate this opportunity to comment on the draft EIS and would be pleased to engage in further conversations about alternatives to Preferred Alternative C.

Thank you,



Jo Smith
Chair

cc: Robyn Thorson, Director
USFWS Region 1

Literature Cited

Lyons, D. E. 2010. Bioenergetics-based predator-prey relationships between piscivorous birds and juvenile salmonids in the Columbia River Estuary. Ph.D. dissertation, Oregon State University, Corvallis, Oregon. 331pp. Available at: www.birdresearchnw.org.

Lyons, D.E., A.F. Evans, N.J. Hostetter, A. Piggot, L. Weitkamp, T.P. Good, D.D. Roby, K. Collis, P.J. Loschl. And B. Cramer. 2014. Factors influencing predation on juvenile salmonids by double-crested cormorants in the Columbia River estuary: A retrospective analysis. Report prepared for the U.S. Army Corps of Engineers – Portland District, Portland, OR. 30 pp.

Pacific Flyway Council. 2012. Pacific Flyway Plan: A framework for the management of double-crested cormorant depredation on fish resources in the Pacific Flyway. Pacific Flyway Council, U.S. Fish and Wildlife Service, Portland, Oregon. 55 pg.

Pauly, Daniel. 1995. Anecdotes and the shifting baseline syndrome of fisheries. Trends in Ecology and Evolution **10**:430.

Roby, D.D., K. Collis, et al. 2014. Research, monitoring, and evaluation of avian predation on salmonid smolts in the lower and mid-Columbia River. Draft Annual Report to Bonneville Power Administration, U.S. Army Corps of Engineers, and Grant County Public Utility District. Accessed online at www.birdresearchnw.org

Wiese, F.K., J.K. Parrish, C.W. Thompson, and C. Maranto. 2008. Ecosystem-based management of predator-prey relationships: piscivorous birds and salmonids. Ecological Applications. 18(3): 681-700

Williams, J.G., 2008. Mitigating the effects of high-head dams on the Columbia River, USA: experience from the trenches. Hydrobiologia 609: 241-251.

Zabel, R.W., and J.G. Williams. 2002. Selective mortality in Chinook salmon: what is the effect of human disturbance? Ecological Applications. 12(1): 173-183.