Pacific Seabird Group

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

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Tara Zimmerman
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Re: Comments on Caspian Tern Predation on Salmon and Steelhead Smolts in the Columbia River Estuary

Dear Tara:

On behalf of the Pacific Seabird Group (PSG), we thank you for the opportunity to review the draft "Caspian Tern Predation on Salmon and Steelhead Smolts in the Columbia River Estuary" by anonymous writers at the National Marine Fisheries Service. As you know, PSG is an international non-profit organization that was founded in 1972 to promote knowledge, study and conservation of Pacific seabirds. PSG takes a broad international perspective in recognition that the oceans are tied together by the wandering of seabirds and the flow of ocean currents. Our membership is drawn from the entire Pacific basin, including Canada, Russia, Japan, China, Mexico, Australia, New Zealand, and the USA. Among PSG's members are biologists who have research interests in Pacific seabirds, government officials who manage seabird refuges and populations and individuals who are interested in marine conservation. PSG has a long history of interest in the Caspian tern issues in the Pacific Northwest.

We must preface this letter by telling you we are unhappy with the quality of work reflected in the report. We offer general and specific comments below which clarify the reasons for this conclusion. Our hope is that these will serve to improve the report and make it a stronger document for all who will look to it for information and recommendations. Please accept them with that goal in mind.

GENERAL COMMENTS

Given the importance of this document in the context of the hysteria that has developed in regard to predation of salmon smolts by birds during the past several years, the quality of the report is rough, its data are incomplete and its logic is flawed. The report fails to include data on or discuss the elevated salmon return rates during the past few years. Given the report's premise in the Executive Summary that tern predation "significantly affects [salmon] recovery" in the face of decades of tern predation, this is a major flaw. Before the increased salmon returns during the past few years, any NMFS presentation of this discussion (e.g. Pollard, "Impacts of Avian Predation on Fisheries and Recovery of ESA Listed Salmon in the Columbia River Basin," 26 Pacific Seabirds 43 (1999)) included graphs showing the decline in salmon returns coinciding with the increase in number of terns over the past few decades. Is the absence of such statistics intentional? The report should evaluate these data and discuss whether NMFS' hypotheses regarding the terns have changed after significant salmon recovery. In May, a joint announcement by the Bonneville Power Administration, U.S. Army Corps of Engineers and Bureau of Reclamation (who operate the river's hydroelectric dams) stated that the Columbia River salmon recovery effort is meeting its goals. Those agencies are meeting their goals despite Caspian tern predation and despite 2001 being the second worst water year on record for the Columbia River. The report should address these facts as well.

SPECIFIC COMMENTS

The Executive summary is a haphazard collection of points apparently inserted by NMFS fishery managers to justify their policy positions but who did not read the underlying report.

Bullet one essentially duplicates the first paragraph of the 'Conclusions' and is a very cursory statement that says salmon aren't doing well in the Columbia River Basin owing to human activities that affect water flows. Where is the section that provides a basin-wide context to the problem (i.e., not enough salmon)?

Bullet two is incorrect. While Caspian terns have recently begun to nest on constructed islands in the Columbia River Estuary, it is not true that predation by Caspian terns on salmonids is new. This has been going on as long as the species have existed.

Bullet four's first clause ("Caspian tern…recovery,") has not been justified in the document. The second clause is true, but summarizes nothing found elsewhere in the document.

Bullet five has not been discussed in the document. It may be referring to the Kareiva et al. paper but the reference here is obscure.

Bullet six has been discussed in the document but for reasons detailed below is false; the premise has not been tested.

Background section.

Paragraph 1. The obscure document by Whitney et al. should be included as an Appendix since the "axiom" discussed therein is central to the report. What the authors may have intended to say

is the "number of adults is a response to number of smolts that survive." What is stated should have been easily testable over the past decades, but apparently no fishery manager has taken the trouble to do so. While salmon managers may be convinced of the axiom, the report provides no data to persuade readers that the axiom is correct. Regarding the second sentence, the persons being "led" are managers, not the scientists/researchers. Salmon do lay many eggs which, in the context of tested demographic principles is done so in evolutionary anticipation that only a few will survive to reproduce. Regarding the fourth sentence, "therefore" has no valid antecedent. Even the first sentence of this paragraph refers to "number of smolts produced" not to their survival, as noted above.

Paragraphs 2 and 3. It has been demonstrated that terns eat a lot of smolts, but it has not been demonstrated that piscivorous birds significantly "limit salmonid stock recovery." Roby et al. (1998) does not lead to this conclusion.

Paragraph 7. The report needs to define its purpose. If this paragraph is intended to fulfill this function, it needs to be more crispy stated.

Caspian Terns Section.

Paragraph 1. Caspian terns are widespread in temperate and subtropical regions, especially along coasts, but are probably not cosmopolitan. Regarding the statement that terns are "expanding in range," it is an axiom among wildlife ecologists is that this constitutes a recovery from former decimation (*see* Cuthbert & Wires; Shuford & Craig). This is equivalent to saying that endangered salmonids populations are expanding -- true but misleading. The 'shift' in colonies from inland is mostly a result of habitat losses due to anthropogenic factors.

Paragraph 3. The timing of reproduction of tern colonies elsewhere, where there are no salmon, has a similar phenology. This should be pointed out so that unsophisticated readers do not draw unwarranted conclusions concerning the timing of salmon escapement and tern breeding.

Predation impacts

Paragraph 4. Use actual percentage equivalents rather than "majority."

Paragraph 6. There are probably numerous factors that might explain why steelhead are more vulnerable than other salmonids, and it is unclear why size was singled out.

Paragraph 10 (p. 6, bottom). The percentages of smolts taken by terns should be wild fish, excluding the non-endangered hatchery fish. Otherwise these data are (intentionally?) misleading.

Paragraphs 8-10. The report fails to discuss the cumulative mortality caused by all predators, and therefore fails to provide critical context for this discussion. Smolts, having escaped the terns, do not inevitably grow to adulthood. The NMFS model has density-dependent elements (stated in paragraph 12). NMFS researchers from the Newport lab recently presented data showing density related growth (therefore, survival?) of smolts in the Columbia River plume. If

managers could eliminate all mortality of younger live stages, the population growth rate would likely improve, although not necessarily in a linear relationship. What does this mean in the context of Caspian terns? Even restricting the inquiry into bird predation, Roby et al. estimated that gull and cormorant mortality in the estuary in 1998 (when the terns were still at Rice Island) was 6.0% of all smolts that reached the estuary versus 11.2% for Caspian terns. Now that the terns nest on East Sand Island, gulls and cormorants take a larger percentage. These data do not take into account the magnitude of ring-billed gull, California gull and cormorant predation in the mid- and upper Columbia. Why not provide context?

Paragraph 11. The discussion of harvest take of adults is an apples vs. oranges comparison. Population growth is far more sensitive to adult mortality (especially of adults about to spawn) than to mortality of smolts. We doubt that any genuine scientist would dispute this.

Paragraph 13. What is the source of predation? The first sentence of the report states that this is axiom, not a mere hypothesis.

Relocation efforts.

While fewer smolts are in the diet of the terns, this is not equivalent to a reduction in predation on smolts. The report states, without citing any data, that owing to the change in tern diet there has now been a "substantial decline in juvenile salmonid mortalities." The report states that 80 million unlisted smolts leave hatcheries, but has no data or modeled estimates of the number that reach the lower Columbia River with or without terns. Many smolts are taken with each mile of travel to the ocean by fish predators, gulls or other factors. The partial diet switch by terns (nesting farther along the smolt route) no doubt reflects a change in smolt availability, but the report presents no data on the availability of smolts in the vicinity of East Sand Island.

Conclusion.

The first three paragraphs belong at the beginning of the "Background" and are not conclusions based on anything in the report. The authors use "normative" without definition or explanation. Does this represent the condition that NMFS prefers as opposed to "natural," thereby ignoring the reasons why the salmon are endangered? If the report is to use this word, it should list those characteristics that classify the habitat as "normative."

Paragraph 3. While Rice Island is artificial, gravel bars and ephemeral islands surely existed in the Columbia River before huge dams were constructed and are the classic breeding habitat of Caspian terns. Essentially the coast south of the Columbia River is more or less a continuous series of sand dunes, many now growing over. This sand likely came from the Columbia River in the pre-dam era when the flows carried huge loads of sediment (much of which now backs up behind various dams). This sediment, besides forming sand dunes along the coast, would have produced bars and ephemeral islands in the river. If the report is trying to say that Caspian terns are new to the system, it is very wrong.

Paragraph 4. As mentioned above, the report presents no data to show that moving the tern colony "successfully decreased overall predation [on salmonids]." The diet did change.

Paragraph 5. While we agree that modifying the estuary to resemble historic natural habitats sounds nice, we doubt that even a single dam will be removed within the foreseeable future. As noted above, terns once nested on the gravel bars and NMFS has no data on which to claim that Caspian terns were never part of the estuary. It is evident from Rice Island and East Sand Island that 'extensive' breeding habitat is not necessary for a huge colony to exist.

Paragraph 6. In the previous paragraph the report seemed to advocate natural conditions, but returns here to "normative" conditions, whatever they are. "Normative" needs to be much better explained or deleted from the report.

Again, we appreciate this opportunity to comment on your draft tern predation report, and will gladly lend our expertise to managing piscivorous birds in the Pacific Northwest at any time.

Sincerely,

Craig S. Harrison
Vice Chair for Conservation