

PACIFIC SEABIRD GROUP TECHNICAL PUBLICATIONS

Exxon Valdez Oil Spill
Seabird Restoration Workshop

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EXECUTIVE SUMMARY

The purpose of this project was to gather knowledgeable scientists from throughout the world to attend a workshop that would identify and evaluate the techniques that can be used to restore seabird populations injured by oil spills. The workshop first addressed seabird restoration from a general perspective, and then applied the general discussions and conclusions to the specific problems of the *Exxon Valdez* oil spill (EVOS) and emphasized the seabird species considered to be "not recovering" from EVOS at the time of the workshop (common murre, harlequin duck, marbled murrelet, and pigeon guillemot). The workshop developed general policy recommendations related to EVOS, and recommendations for specific restoration techniques that should be applied to common murre, marbled murrelet, and pigeon guillemot populations in the EVOS area. The workshop also described and discussed over 20 different restoration techniques (including natural recovery) and outlined their assumptions and deficiencies. It was apparent to the workshop participants that critical baseline data are lacking for measuring injury to many seabird populations in the EVOS area, and for evaluating the efficacy of potential restoration projects. The workshop determined that such data are needed, and proposed a series of research recommendations to achieve this end. Finally, although this report contains many specifics related to EVOS, it also provides generic guidance for developing seabird restoration plans anywhere.

GENERAL POLICY RECOMMENDATIONS

- The *Exxon Valdez* Oil Spill Trustee Council (Trustee Council) should enlarge the oil spill impact area for seabirds beyond the immediate oil spill zone. Defining the oil spill area based on oiled shorelines fails to recognize the larger geographic area in which seabird populations may have been injured, and severely limits restoration options for species with high rates and distances of dispersal. Restoring seabird colonies outside the spill zone may facilitate restoration of colonies within the spill zone.
- The process by which resources are included, reclassified, or removed from the "Injured Resources" list needs to be improved. The workshop developed criteria to be used to determine if the population effects resulting from a spill are a concern, and to establish a priority list for restoration activities. We recommend that the Trustee Council adopt these criteria and use them as guidelines for identifying the seabird species or populations requiring restoration. Finally, the Trustee Council should continue to open the classification process to scientific scrutiny and review.
- New toxicants to control or eradicate introduced predators or competitors need to be registered. While the Department of Interior may be the lead agency for this recommendation, the Trustee Council should endorse this approach.
- There should be multi-year commitments by the Trustee Council on specific projects, especially field studies that measure parameters known or expected to show high annual

variability. The funding of the Alaska Predator Ecosystem Experiment (APEX) project (Restoration Project 95163) by the Trustee Council is an example of how multi-year funding should proceed.

GENERAL RESEARCH RECOMMENDATIONS

- The geographic and demographic structures of the populations need to be delineated for all nonrecovering species. Genetic and morphometric studies, as well as long-term demographic studies at representative colonies, are examples of how these data can be collected. Populations should also be modeled to assess the potential of particular restoration techniques.
- At this time the Trustee Council is making assumptions about which seabird populations were most affected by the spill. The assumption that the affected populations were in the oil spill area may be incorrect, and genetic and morphometric analysis of carcasses recovered after the spill may help identify which populations were injured and where to target restoration projects.
- The Trustee Council should fund studies that examine trophic interactions and the impacts of net fisheries on seabird population demographics to determine if human-induced alterations to trophic interactions can increase prey availability and therefore enhance the recovery of seabird populations.
- Existing resource sensitivity maps that identify critical areas requiring protection need to be updated and integrated. While individual agencies take the lead for this recommendation, the Trustee Council should endorse this approach.
- All restoration activities *and* nonrecovering species need to be monitored to determine if restoration projects are succeeding or if populations are recovering naturally.
- The workshop endorsed the idea to fund endowed chairs in marine ornithology at the University of Alaska, to assure continuing research on seabirds in all of Alaska and especially the Gulf of Alaska.

GENERAL RESTORATION RECOMMENDATIONS

The workshop determined that the following were the most promising restoration techniques: management of human impacts (e.g., reducing fisheries bycatch of seabirds, reducing breeding habitat loss resulting from habitat destruction or colony disturbance, preventing introduction of predators); habitat or nest site creation or enhancement (e.g., habitat preserves, land purchases, improvements in habitat quality); and predator control at colonies. These are broad-based techniques that benefit a suite of species. The removal of introduced exotic species from islands has the potential to restore an entire ecosystem, not just one species of seabird, while the effective management of net fisheries bycatch will benefit all species that are inadvertently taken in fishing nets.

The workshop also determined that adding birds to wild populations through captive rearing, translocation, and rehabilitation offer the lowest probability of success of all restoration techniques considered in this workshop. Among the major shortcomings of these techniques are that they are extremely labor intensive there is a relatively high risk of failure or low level of success, and they are expensive. Furthermore, these techniques are most appropriate when whole colonies have been extirpated or when populations are close to extinction.

Of particular interest were our discussions on the feasibility of enhancing food resources for seabirds through altering fisheries management practices. We determined that these techniques may be very useful in restoring seabird populations, but that not much is known about the logistical feasibility of these techniques or their population- or community-level effects. We recommended that funds be made available to research these techniques.

PRIMARY RECOMMENDATIONS TO RESTORE MARBLED MURRELETS

- Protect nesting habitat by conserving large tracts of suitable habitat, especially old-growth forests and lands around the heads of bays. Public and private forests should be managed to minimize the disturbance of nesting areas and to prevent the increase and concentration of predators.
- Reduce predation on nest contents by corvids, squirrels, and small mustelids, especially where it decreases reproductive success.
- Reduce bycatch in salmon gillnets, which annually may equal half of the mortality from the *Exxon Valdez* Oil Spill.
- Monitor population trends at sea, breeding productivity (based on at-sea surveys), activity levels at nesting locations, and annual mortality.

PRIMARY RECOMMENDATIONS TO RESTORE COMMON MURRES

- Reduce mortality and increase recruitment and breeding success by removing introduced predators from colonies, preventing the introduction of predators, reducing gillnet mortality, and reducing human disturbance at colonies.
- Examine food-web interactions to allow determination of fishery management techniques that will enhance seabird restoration. These include interactions between seabirds and hatchery-reared salmon and forage fish, the relationships between pollock harvests and murre productivity, the relationships between nearshore habitat types and sand lance spawning, and the effects of residual oil on forage fish that are an important part of common murre diets.
- Monitor the size and productivity of breeding populations and the survival and dispersal of adults.

PRIMARY RECOMMENDATIONS TO RESTORE PIGEON GUILLEMOTS

- Control egg and chick predators, including corvids, mink, and river otter.
- Create or enhance nest sites.
- Control human disturbance at colonies and investigate the degree to which guillemots are affected by gillnet fisheries.
- Monitor populations of adult birds at affected colonies as well as productivity and growth rates at target and reference colonies.

RECOMMENDATIONS TO RESTORE KITTLITZ'S MURRELETS

- Reduce disturbance at foraging sites and known nesting areas.
- Investigate and reduce gillnet mortality.

RECOMMENDATIONS FOR RESEARCH ON KITTLITZ'S MURRELETS

- Determine breeding abundance and distribution.
- Investigate breeding phenology, habitat use, and diet, and if population size and growth are limited by prey abundance.

RECOMMENDATION TO RESTORE COMMON LOONS

- Identify breeding areas of nonrecovering populations.

RECOMMENDATIONS TO RESTORE PELAGIC, DOUBLE-CRESTED, AND RED-FACED CORMORANTS

- Identify breeding colonies of nonrecovering populations.
- Conduct restoration activities similar to the primary recommendations for common murres (listed above).

This report also provides background and rationale for the workshop's recommendations, and a fuller discussion of the biological and ecosystem factors that affect these decisions. We set down specific operational goals for restoration activities, and evaluated these goals in terms of their assumptions, their constraints, and our ability to measure progress through monitoring. We also discussed the importance (and assumptions and limitations) of modeling restoration activities, and outlined population-, community-, and ecosystem-level factors that may affect restoration of seabird populations. The workshop emphasized that restoration efforts may be constrained by factors that either are uncontrolled by the restoration activities or are uncontrollable (e.g., global warming and its effect on fish distribution).