Amendment to the Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan

Original Recovery Plan Approved: April 25, 1983
Original Recovery Plan Prepared by: Pacific Region, U.S. Fish and Wildlife Service

Recovery Plan Amendment Approved:

Mary M Brown Date 7 Aug 2019

Acting **Regional Director, Pacific Region**
U.S. Fish and Wildlife Service

Species addressed in Amendment: Newell's Townsend's Shearwater (*Puffinus auricularis newelli*) [originally listed as Newell's Manx Shearwater (*Puffinus puffinus newelli*)]

We have analyzed all of the best available information and find that there is a need to amend the recovery criteria for the Newell's Townsend's Shearwater (*Puffinus auricularis newelli*) that have been in place since the recovery plan was completed in 1983. In this amendment, we discuss the adequacy of the existing recovery criteria, identify amended recovery criteria, and present the rationale supporting the recovery plan modification. The modification is to be shown as an appendix that supplements the recovery plan, superseding only the Objective section (pages 22-24) in Part II (Recovery) of the recovery plan (USFWS 1983).

BACKGROUND INFORMATION

Recovery plans should be consulted frequently, used to initiate recovery activities, and updated as needed. A review of the recovery plan and its implementation may show that the plan is out of date or its usefulness is limited, and therefore warrants modification. Keeping recovery plans current ensures that the species benefits through timely, partner-coordinated implementation based on the best available information. The need for, and extent of, plan modifications will vary considerably among plans. Maintaining a useful and current recovery plan depends on the scope and complexity of the initial plan, the structure of the document, and the involvement of stakeholders.

An amendment involves a substantial rewrite of a portion of a recovery plan that changes any of the statutory elements. The need for an amendment may be triggered when, among other possibilities: (1) the current recovery plan is out of compliance with regard to statutory requirements; (2) new information has been identified, such as population-level threats to the species or previously unknown life history traits, that necessitates new or refined recovery actions and/or criteria; or (3) the current recovery plan is not achieving its objectives. The amendment replaces only that specific portion of the recovery plan, supplementing the existing recovery plan, but not completely replacing it. An amendment may be appropriate in cases where significant plan improvements are needed, but resources are too scarce to accomplish a full recovery plan revision in a short time.

Although it would be inappropriate for an amendment to include changes in the recovery program that contradict the approved recovery plan, it could incorporate study findings that enhance the

scientific basis of the plan, or that reduce uncertainties as to the life history, threats, or species' response to management. An amendment could serve a critical function while awaiting a more comprehensive revised recovery plan by: (1) refining and/or prioritizing recovery actions that need to be emphasized, (2) refining recovery criteria, or (3) adding a species to a multispecies or ecosystem plan. An amendment can, therefore, efficiently balance resources spent on modifying a plan against those spent on managing implementation of ongoing recovery actions.

METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT

The Hawai‘i listed seabird working group meets in person twice yearly, and via email or phone call as needed, and is comprised of personnel from the U.S. Fish and Wildlife Service (Service), State of Hawai‘i Division of Forestry and Wildlife, National Park Service, and University of Hawai‘i who are associated with managing listed seabirds. In 2009, this group developed a 5-year action plan (Bailey *et al*. 2009), that has since been updated (Bailey *et al*. 2015). This plan outlines short-term recovery objectives and action items to further the recovery of the Newell's shearwater (*Puffinus auricularis newelli*), Hawaiian petrel (*Pterodroma sandwichensis*), and band-rumped storm-petrel (*Oceanodroma castro*). The Service requested the input of this group to develop the amended delisting criteria for Newell's shearwater. The group wanted to ensure consistency between the objectives in the action plan (Bailey *et al*. 2015) and the amended recovery criteria. They met once in person and subsequently by phone and email to develop, refine, and finalize the new criteria. Further, they included the most up-to-date information about the species; particularly that provided by the Kaua‘i Endangered Seabird Recovery Program, to assess the population status and current threats to further refine the criteria.

A draft of this recovery plan amendment was published for public review on January 31, 2019 (84 FR 790). In addition, we sought peer review. Please see the Appendix for a summary of the comments received and our responses.

ADEQUACY OF RECOVERY CRITERIA

Section 4(f)(1)(B)(ii) of the Endangered Species Act (Act) requires that each recovery plan shall incorporate, to the maximum extent practicable, "objective, measurable criteria which, when met, would result in a determination… that the species be removed from the list." Legal challenges to recovery plans (see Fund for Animals v. Babbitt, 903 F. Supp. 96 (D.D.C. 1995)) and a Government Accountability Audit (GAO 2006) also have affirmed the need to frame recovery criteria in terms of threats assessed under the five listing factors.

Recovery Criteria

See previous version of criteria in Part II. Recovery, pages 22-41 of the Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan (USFWS 1983).

Synthesis

An estimated 90 percent of the population of Newell's shearwaters occurs on Kaua‘i, but they are known to also occur on Hawai‘i Island, Maui, and O‘ahu (Ainley *et al*. 2019; USFWS unpublished; and Young and VanderWerf 2016). Research and management by the Kaua‘i Endangered Seabird Recovery Project has increased our understanding of the status of the population on Kaua‘i, and surveys on the other main Hawaiian islands have provided some information about its distribution on those islands.

Ornithological radar surveys have been conducted at 13 sites across Kaua‘i since 1993, thus providing documentation of the population trend for that period of time. Ornithological radar has been used to monitor the summer movement patterns and provides an accurate estimate of numbers of birds as they transit through the detection area (Day and Cooper 1995; Raine *et al*. 2017). Analysis of this data (Day and Cooper 1995; Raine *et al*. 2017) has shown an appreciable reduction in the number of shearwaters transiting to and from montane breeding colonies between 1993 and 2013. The overall mean number of shearwaters detected across all 13 radar sites surveyed in 1993 was 524 ± 207 radar targets/h; in 2013 it was 33.5 ± 9.2 targets/h, representing a significant decrease of 94 percent between the 2 periods ($t = 2.37$, $P = 0.03$; Raine *et al*. 2017). All of the 13 sites showed a large decrease in movement rates over the entire period, with movement rates at 12 out of 13 (92 percent) sites showing statistically significant declines across the entire study period (Raine *et al*. 2017). Using the radar data as a proxy for the breeding population, the Newell's shearwater population on Kaua‘i declined at a mean annual rate of 13 percent over the 20-year period (Raine *et al*. 2017). This most recent analysis of the Newell's shearwater population trend is comparable to the mean annual 11.2 percent decline reported by Day *et al*. (2003) for the period from 1993 to 2001.

Threats to Newell's shearwater described in the original listing rule and the recovery plan continue largely unabated. Fallout from artificial light attraction (attraction of seabirds to lights, causing disorientation and grounding away from the ocean) (Save our Shearwaters [SOS] 2018), collision with infrastructure (including power lines), predation, and habitat loss continue to threaten this species. Although shielding of lights in recent years in localized areas has somewhat reduced the exposure of fledglings to this threat, annual fallout from artificial light continues to impact this declining population. Further, we now know that collision with power lines and transmission lines is a much greater threat than was previously considered (Travers *et al*. 2016). Predator control has been implemented at several sites as part of a habitat conservation plan, and via funding from the National Fish and Wildlife Foundation and American Bird Conservancy. However, the threat posed by introduced predators remains significant throughout the species' range as these efforts protect only a fraction of the breeding population. Predators (particularly cats and feral pigs) take adults as well as eggs and juveniles. This is especially devastating to this long-lived species which does not reach reproductive maturity until about age 6 and has a high proportion of nonbreeding adults. As none of the predator control sites are surrounded by predator-proof fences, predator ingress is constant.

Little progress has been made toward addressing the chief threats to, or meeting the recovery criteria for, Newell's shearwater. The population on Kaua‘i has declined 94 percent since 1993, or 13 percent annually (Raine *et al*. 2017). Breeding colonies on other islands have not been delineated and thus are not managed. These colonies are certainly subject to predation by alien mammals, as well as from the threat of light attraction and infrastructure collision, and likely are dwindling as well.

AMENDED RECOVERY CRITERIA

Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened, or that the protections afforded by the Act are no longer necessary and the Newell's shearwater may be delisted. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Downlisting is the reclassification of a species from endangered to threatened.

The term "endangered species" means any species (species, subspecies, or distinct population segment) that is in danger of extinction throughout all or a significant portion of its range. The term "threatened species" means any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

We provide delisting criteria for the Newell's shearwater, which supersede those included in the Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan (USFWS 1983), as follows:

Downlisting Recovery Criteria
Not applicable

Delisting Recovery Criteria
The Newell's shearwater may be considered for delisting when the following four criteria are met:

Criterion 1: Viable Newell's shearwater metapopulations that represent the ecological, morphological, behavioral, and genetic diversity of the species occur within their current and historical distribution on seven of the eight main Hawaiian Islands.

Criterion 2: Quantitative surveys show that the population trend at locally monitored sites on each island has been stable or increasing over a period of at least 30 consecutive years, or demographic monitoring shows that each island metapopulation exhibits an average intrinsic growth rate not less than 1.0 over a period of at least 30 consecutive years.

Criterion 3: Newell's shearwater breeding sites through the current and historical distribution of the species are effectively protected and managed (*e.g.*, ungulate/predator-proof fencing, intensive control of small mammals and avian predators) over an area sufficient to achieve Criteria 1 and 2 above.

Criterion 4: The threats responsible for the decline of Newell's shearwaters have been sufficiently managed to achieve Criteria 1 and 2 above, and the needed threat management will be in place for the foreseeable future.

All classification decisions consider an analysis of the following five factors: (1) is there a present or threatened destruction, modification, or curtailment of the species' habitat or range; (2) is the species subject to overutilization for commercial, recreational scientific or educational purposes; (3) is disease or predation a limiting factor; (4) are there inadequate existing regulatory mechanisms in place outside the Act (taking into account the efforts by states and other organizations to protect the species or habitat); and (5) are other natural or manmade factors affecting its continued existence. When delisting or downlisting a species, we first propose the action in the Federal Register and seek public comment and peer review of our analysis. Our final decision is announced in the Federal Register.

Rationale for Recovery Criteria
The amended delisting criteria are based upon the most up to date information about the species'

biology, the most recent 5-year review (USFWS 2017), the Newell's Shearwater Landscape Strategy (USFWS unpubl.), the Newell's Shearwater, Hawaiian Petrel, and Band-rumped Storm-Petrel Action Plan (Bailey *et al*. 2015), and expert opinion. An estimated 90 percent of the population of Newell's shearwaters occurs on Kaua'i (Ainley *et al*. 2019 and USFWS unpublished), so most of the research and management has focused on this population. To date, monitoring of populations on other islands has not occurred. However, our existing knowledge does allow us to make some general predictions about likely interactions among island populations of this species. Nest monitoring has shown that breeding birds are philopatric, returning to the same burrow each year (A. Raine, pers. comm. 2019). The tendency of highly mobile birds such as Newell's shearwaters to forage great distances from breeding sites but rarely disperse among nearby breeding sites has been termed the "seabird paradox" (Milot *et al*. 2008). Genetic differentiation, foraging segregation, and morphometric differences in populations of Hawaiian petrels has been documented (Welch *et al*. 2012, Wiley *et al*. 2012, Judge *et al*. 2014) demonstrating the seabird paradox in that species with an estimated interisland dispersal rate of less than 1 bird per 1,000 generations. Given that approximately 90 percent of the Newell's shearwater population is thought to occur on Kaua'i (Ainley *et al*. 1997) and that most seabirds exhibit high philopatry (Hamer *et al*. 2001), we conclude that Newell's shearwater dispersal between islands is likely to be similar to or even less than that in Hawaiian petrels. Thus, the populations of Newell's shearwaters on each island are probably functionally independent.

When defining the term "metapopulation" in Delisting Criterion 1 for Newell's shearwaters, we used the definition applied by Akcakaya *et al*. (2007) wherein a metapopulation is a set of geographically discrete populations that may exchange individuals through migration, dispersal, or human-mediated movement where the mixing of individuals between populations is less than that within them. Thus we considered each island as a separate metapopulation comprised of multiple populations. We modified Delisting Criterion 1 from the criterion published in the draft amendment because it is not clear that the various interacting populations on the islands of Maui or Hawai'i would naturally be separated into two distinct metapopulations on the same island, or that such separation would be beneficial for the species. The exclusion of Ni'ihau from the criterion published in the draft amendment reflected the infeasibility of restoring, managing, and monitoring breeding sites given current lack of access to the island. If accessibility were to improve in the future, breeding populations on Ni'ihau might potentially contribute to meeting recovery criteria, but Ni'ihau populations are not required in order to meet the criteria.

When evaluating population growth under Delisting Criterion 2 we will utilize several metrics, including demographic monitoring within managed units. Because the managed units are likely to be a subsets of a breeding colony, we modified the criterion using the term "locally monitored sites" to describe those managed and monitored units. The unit size and monitoring protocols may vary among islands depending on habitat characteristics and dispersion of nest sites within the colonies. Overall metapopulation viability is assessed at the scale of each island.

We modified Delisting Criterion 3 from the criterion published in the draft amendment, because we determined that it would not be feasible to quantify the specific percentage of suitable breeding habitat being protected and managed. In particular, the denominator of such a percentage is difficult to clearly define because the species historically bred in a wide variety of habitats throughout the Hawaiian islands; breeding success is primarily dependent on site management and predator protection at a local scale, and on maintaining safe movement corridors at the landscape

scale, rather than the availability of suitable habitat with boundaries that could be delineated on the basis of topography or vegetation. It is important to emphasize that site management must be effective at minimizing predation impacts in order for viable self-supporting populations to exist.

The recovery criteria reflect the best available and most up-to-date information about the species and its habitat. The recovery criteria reflect all known threats to this species. These include protection of suitable habitat to sustain the ecological, morphological, behavioral and genetic diversity of the species (Factor A), predation (Factor C), and management of anthropogenic threats (Factor E) such that the populations are self-sustaining and stable. Please see USFWS (2017) for the most recent analysis of threats to, and ongoing conservation efforts for, the Newell's shearwater.

The amended recovery criteria for Newell's shearwater support representation by ensuring the ecological, morphological, behavioral and genetic diversity of the species is conserved throughout its range. The criteria support resiliency through stable or increasing populations. The criteria support redundancy by recommending distribution throughout the species' historical range. The recovery criteria are objective and measurable. Information is accurate, unbiased, and based upon the best available data known at this time.

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PERSONAL COMMUNICATIONS

A. Raine, June 6, 2019 email discussing the trend for NESH using SOS data.

APPENDIX. SUMMARY OF PUBLIC, PARTNER, AND PEER REVIEW COMMENTS RECEIVED

Summary of Public Comments

We published a notice of availability in the *Federal Register* on February 5, 2019 (84 FR 1782-1784) to announce that the Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan was available for public review, and to solicit comments by the scientific community, State and Federal agencies, Tribal governments, and other interested parties on the general information base, assumptions, and conclusions presented in the draft revision. An electronic version of the draft amendment was posted on our Species Profile website (https://ecos.fws.gov/docs/recovery_plan/NESH_Draft_Recovery_Plan_Amendment_20180806.pdf). We also developed and implemented an outreach plan that included: (1) publishing a news release on our national webpage (https://www.fws.gov/news/) on January 30, 2019, (2) sending specific notifications to Congressional contacts in Hawaii's first and second Congressional Districts, and (3) sending specific notifications to key stakeholders in conservation and recovery efforts. These outreach efforts were conducted in advance of the *Federal Register* publication to ensure that we provided adequate notification to all potentially interested audiences of the opportunity to review and comment on the draft amendment.

We received five responses in total. These included comments from interested citizens as well as non-governmental organizations and interest groups.

Public comments ranged from providing minor editorial suggestions to specific recommendations on plan content. We have considered all substantive comments; we thank the reviewers for these comments and to the extent appropriate, we have incorporated the applicable information or suggested changes into the final recovery plan amendment. In response to comments expressing confusion about some of the terminology in the draft revised recovery criteria, we updated Delisting Criteria 1 through 3 to address those concerns, and provided scientific references to support the new criteria and definitions for our terminology in the Rationale for Recovery Criteria section. Below, we provide a summary of public comments received; however, some of the comments that we incorporated as changes into the recovery plan amendment did not warrant an explicit response and, thus, are not presented here. We also provided copies of all comments received during the formal public comment period to all relevant Federal agencies for their consideration prior to implementation of the final recovery plan, in accordance with section 4(f)(5) of the Act.

Comment (1): Concern that, "criteria are being added in the absence of any scientific peer review and that this will lead to a failure on the Service's part to follow the best-available science."

Response: Peer review was conducted following the publication of the Notice of Availability, and in accordance with the requirements of the Endangered Species Act (Act). Below we provide a detailed summary of peer review comments and our responses, where appropriate.

Comment (2): Concern that, "the decision to update recovery criteria for these 42 species as a group is indicative of the Service moving away from utilizing recovery teams and outside scientific expertise."

Response: Section 4 of the Act provides the Service with the authority and discretion to appoint recovery teams for the purpose of developing and implementing recovery plans. The current effort to update recovery plans with quantitative recovery criteria for what constitutes a recovered species is not indicative of the future need for, and does not preclude the future utilization of, recovery teams to complete recovery planning needs for listed species.

Comment (3): New and significant information has been developed in the years since the existing recovery plan was adopted. Updating this plan can serve to better inform the Service, the regulated community, and Federal, State, and local resource agencies.

Response: A recovery plan should be a living document, reflecting meaningful change when new substantive information becomes available. Keeping a recovery plan current increases its usefulness in recovering a species by ensuring that the species benefits through timely, partner-coordinated implementation based on the best available information.

Comment (4): The Service should consider whether the updated recovery criteria would be less burdensome on Federal agencies and the regulated community than the existing criteria.

Response: Recovery plans are guidance documents that outline how best to help listed species achieve recovery, but they are not regulatory documents. Recovery plans are intended to establish goals for long-term conservation of listed species and define criteria that are designed to indicate when the threats facing a species have been removed or reduced to such an extent that the species may no longer need the protections of the Act.

Recovery criteria are achieved through the funding and implementation of recovery actions by both the Service and our partners. In addition to the existing recovery actions included in each of these recovery plans, the amendments address the need for any new, site-specific recovery actions triggered by the modification of recovery criteria, along with the costs, timing, and priority of any such additional actions. Because recovery plans are not regulatory documents, identification of an action to be implemented by any public or private party does not create a legal obligation beyond existing legal requirements. Nothing in a recovery plan should be construed as a commitment or requirement that any Federal agency obligate or provide funds.

Comment (5): The Service should consider whether the recovery criteria are achievable, because including unattainable recovery criteria could render such plans meaningless, or impede other processes under the Act.

Response: The National Marine Fisheries Service and U.S. Fish and Wildlife Service Interim Endangered and Threatened Species Recovery Plan Guidance (2010) emphasizes the development of recovery criteria that are specific, measurable, achievable, realistic, and time-referenced (SMART). The achievable component of SMART criteria implies that the authority, funding, and staffing needed to meet recovery criteria are feasible, even if not always likely.

In developing recovery criteria specifically, we attempt to establish criteria that are both scientifically defensible and achievable to the greatest extent possible. At times, however, the feasibility of achieving certain criteria can be, or appear to be, constrained by the particular, difficult circumstances that face a species. Even in such cases, criteria serve to guide recovery

actions and priorities for the species. Furthermore, as recovery progresses, periodic reevaluation of the species status through the 5-year review process may reveal that the barriers to achieving certain criteria have been removed or that circumstances or our understanding of the species have evolved. In that event, the Service can revise recovery criteria to ensure that they reflect the strategy most likely to succeed in the goal of recovery.

Comment (6): The Service should consider conservation efforts that have been put into place for the listed species since the previous iteration of the recovery plan, especially where the Service has supported conservation efforts, in formulating recovery criteria that will be established or amended by the revised draft plan.

Response: While section 4 of the Act directs the Service to specifically develop and implement recovery plans, several other sections of the Act and associated programs and activities also provide important opportunities to promote recovery. Information from these programs and activities about the biological needs of the species can inform recovery planning (including the formulation or revision of recovery criteria) and implementation. These conservation efforts have been considered during the development of this and other recovery plans.

Comment (7): The Service should determine whether ongoing species conservation efforts beneficially address one or more of the listing factors set forth in the Act implementing regulations addressing species listings and designation of critical habitat.

Response: All Service decisions that affect the listed status or critical habitat designation of a particular species, including our 5-year review of each listed species, are made by analyzing the five factors described in section 4 of the Act. Such an analysis necessarily includes an assessment of any conservation efforts or other actions that may mitigate or reduce impacts on the species. While our objective with this particular effort was to establish objective, measurable criteria for delisting, conservation actions play a crucial role in determining if and when those criteria have been satisfied.

Comment (8): The Service should be mindful of the impacts that recovery plan criteria can have on the section 7 process of the Act for the regulated community, because the Service and other Federal resource agencies sometimes request that recovery criteria be addressed in biological assessments and other planning processes under the Act addressing listed species.

Response: Recovery plans can both inform, and be informed by section 7 processes of the Act. When revising a recovery plan, existing section 7 consultations may provide helpful information on: recent threats and mechanisms to avoid, minimize, or compensate for impacts associated with those threats; a summarized status of the species; and indication of who important partners may be. Section 7 consultations can inform the need for revised recovery actions, recovery implementation schedule activities, recovery criteria, or species status assessments to provide more comprehensive recovery planning while the species remains listed.

Comment (9): The Service should include the full panoply of current information available for the species in all revised draft recovery plans.

Response: Our recovery planning guidance recommends that recovery planning be supported by

compilation of available information that supports the best possible scientific understanding of the species. Although it is not necessary to exhaustively include all current information within the text of the recovery plan, to the extent that this information is specifically relevant and useful to recovery, the recovery plan may summarize such material or incorporate it by reference. Supporting biological information may also be included within a species status assessment or biological report separate from the recovery plan document itself.

Comment (10): The Service should consider whether the existing recovery plan should be revised or replaced in its entirety rather than amended in part.

Response: Under guidance established in 2010, partial revisions allow the Service to efficiently and effectively update recovery plans with the latest science and information when a recovery plan may not warrant the time or resources required to undertake a full revision of the plan. To further gauge whether we had assembled, considered, and incorporated the best available scientific and commercial information into this recovery plan revision, we solicited submission of any information, during the public comment period, that would enhance the necessary understanding of the species' biology and threats, and recovery needs and related implementation issues or concerns. We believe the recovery plan amendment, which targets updating recovery criteria, is appropriate for the species. However, we will also continue to evaluate the accuracy and usefulness of the existing recovery plan with respect to current information and status of conservation actions, and may pursue a full revision of the plan in the future, if appropriate.

Comment (11): Travers *et al*. (2016), which quantifies collisions by Newell's shearwaters with transmission lines and power lines in remote areas, is not peer reviewed and should be peer reviewed if it is the foundation for conservation efforts.

Response: The Service uses the best information available. Although Travers *et al*. (2016) has not been published, it has been peer reviewed.

Comment (12): The radar and SOS [Save our Shearwaters] data summarized in Raine *et al*. (2017) do not include the trends for the North Shore nesting areas, and bio-logging data show they (primarily) arrive and depart across areas not impacted by lights and power lines.

Response: In the Discussion section of Raine *et al*. (2017), the authors recommend including the Na Pali Coast (North Shore) in future radar surveys, and state that it has not been included to date because it is inaccessible by road. Data collected by radar and from the SOS program has been, to date, the longest data set on the population trend for this species on Kaua'i. It has documented a precipitous decline since 1993. The data may more clearly document the trend for colonies closer to areas with lights and power lines, which demonstrates the ongoing loss of colonies in the path of those anthropogenic threats. While the colonies on the North Shore may not be affected as greatly by lights and power lines, predation and habitat degradation certainly affect them. The synopsis was documenting the drastic decline in the species on Kaua'i over the past 20 years, and the trend described in Raine *et al*. (2017) demonstrates a substantial loss in the distribution of the species and in its population size.

Comment (13): Given that SOS and radar data from recent years [as described in Raine et al. (2017)] indicate stability in the Kaua'i Newell's shearwater population, we may be close to

achieving Criterion 2.

Response: Criterion 2 is based upon population trends from locally monitored populations. Trends from radar surveys and SOS collections are an index of the *overall* population trend and Raine *et al*. (2017) demonstrate a precipitous decline of 94 percent over 20 years. The rate of decline reported decreased during the last few years of the analysis are due to the extirpation of colonies subject to the measurements by radar and SOS collection, not to an improvement in the status of the species on Kauai.

Comment (14): The Service should consider short-term milestones toward the long-term recovery goal stated in Criterion 2.

Response: If we develop a step-down outline with these criteria, then the outline would identify interim goals to periodically measure and achieve the criterion.

Comment (15): For Criterion 1 and Criterion 2, we recommend the Service consider committing to regular evaluations of these trends and metrics, internally and with external experts such as a formal recovery team to adaptively manage effort by the Service and partners.

Response: Regular monitoring of the recovery criteria will inform management decisions, and several opportunities currently exist to do so. Recovery permits issued for Newell's shearwater burrow monitoring, reports from existing section 7 consultations under the Act and existing and in-process section 10 habitat conservation plans will provide us with some of those measures. Further, the Service is a partner in a listed seabird working group that consists of the local and Federal agencies directly involved in listed seabird management and recovery which will also be a source of information and expertise.

Comment (16): The proposed criteria do not address the concept of minimum viable population; the species needs to have numeric population targets established for the populations on each island and for the listed entity as a whole.

Response: We do not currently have a method for directly measuring the population size of the Newell's shearwater. Their nocturnal habits and cryptic nesting sites make it difficult to directly count individuals and estimate the population. Instead we have relied upon radar surveys and downed bird retrieval as an index of the population trend on the island of Kaua'i, as well as nighttime within-colony auditory and visual surveys to provide an indicator of abundance. These methods are not reliable measures of population size. More recently, we have used remote sensing automated acoustical units that record calls within a colony to both assess activity levels within a colony and to survey new sites for calling activity. None of these measures can be used to develop a population estimate for the species; thus we are dependent on estimating population trends using proxy measures as described in the criteria. If in the future, we have a reliable way of estimating the population, we would either identify numerical targets in our management plans or revise the criteria to include population targets.

Comment (17): Quantifiable measures of "the 3Rs" (resiliency, representation, and redundancy) should be used as criteria for this species.

Response: As discussed above, numeric targets that effectively measure the population are difficult to establish for this species. However, the revised criteria do provide measures of the 3Rs. Criterion 1 addresses redundancy and representation through ensuring the species' range is maintained which protects the inherent genetic diversity and existing biogeographic variability. Criterion 2, in part, measures resiliency. Criteria 3 and 4 help ensure resiliency, redundancy, and representation are maintained.

Comment (18): Criterion 3 should focus on currently occupied nesting colonies.

Response: Protecting currently occupied habitat is a priority. If we developed a step-down outline with these criteria, then the outline would prioritize protecting occupied habitat. However, this species lives in extremely remote and rugged terrain and management tools such as fencing and effective predator control may not be an option. In such situations, we might choose to protect adjacent habitat and attract birds to that site.

Comment (19): Criterion 4 should require the management needed to reach and maintain target population levels and population growth rates.

Response: As discussed above, numeric targets that effectively measure the population are difficult to establish for this species, thus we do not specify population targets in our criteria.

Summary of Peer Review Comments

We solicited independent peer review between the draft and final amendment in accordance with the requirements of the Act from the State of Hawaii Division of Forestry and Wildlife, U.S. Navy, U.S. Air Force, National Fish and Wildlife Foundation, Hawaii Volcanoes National Park, Haleakala National Park, and the University of Hawaii Pacific Cooperative Studies Unit. Criteria used for selecting peer reviewers included their demonstrated expertise and specialized knowledge related to Newell's shearwater, seabird biology, land management, and threats to the Newell's shearwater and its habitat. The qualifications of the peer reviewers are in the decision file and the administrative record for this recovery plan amendment.

In total, we solicited review and comment from 12 peer reviewers and 7 partner agencies. We did not receive any comments from peer reviewers or partner reviewers.