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Guidance for Treatment of Climate Change in NMFS Endangered Species Act Decisions

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Endangered Species Act

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Introduction

When the Endangered Species Act (ESA) became law in 1973, climate change was not a widely recognized issue. Since that time climate change has become a key lens through which resource management decisions must be evaluated and addressed. Over the past several years, National Marine Fisheries Service (NMFS) staff has been working to develop standard approaches for incorporating climate change related information into agency decisions. The courts have affirmed the importance of considering climate change in determinations and decisions under the ESA, despite the uncertainty that makes predicting specific impacts from climate change challenging.

Resource managers are frequently called upon to make decisions in the face of uncertain information on any number of issues, and NMFS is adept at doing so. A changing climate further complicates the conservation of protected resources, due in large part to the uncertainty of the rate and magnitude of climate-related changes and the response of various organisms to those changes. The question of how much risk is acceptable to listed species is raised in most ESA decisions, even without climate change considerations. Due to the nature and magnitude of the risk added by potential climate change effects and the associated increase in uncertainty due to climate change, it is useful for NMFS to adopt policy guidance to manage this risk consistently and explain the basis for the choices the agency makes.

The ESA requires use of the best available science[1] in reaching particular decisions, but gives deference to the exercise of informed agency discretion where scientific uncertainty exists if the agency provides a well-reasoned explanation that is based on consideration of all relevant factors; takes into account all relevant available information; and explains the relative weight assigned to competing sources of information. While it requires that decisions not be based on mere generalizations or speculation, the best available science standard does not require that information be free from uncertainty. Nor does it require a higher degree of specificity, or fineness of scale in projections, than existing climate studies allow. For example, to support listing a species on the basis of climate change related impacts, we must have information particular to that species to demonstrate that it will be impacted by climate change, such as through a reduction of suitable habitat within its known range. It is not necessary, however, to have projections at a particular geographic scale or to have a complete understanding of the biological reasons for and extent of the species' sensitivity to climate change. The alternative to developing guidance is the current practice of making these decisions on a case-by-case basis, possibly leading to duplicative efforts and inconsistencies across NMFS management units and across different ESA decisions.

Our experiences with recent ESA listing decisions *(e.g.,* ice seals and corals) have reinforced the importance of agency climate change policy guidance to better support our ESA resource

[1] For ESA listing decisions [Section 4(b)(1)(A)] and biological opinions [Section 7(a)(2)], the complete standard is "best scientific and commercial data available" and for critical habitat determinations [Section 4(b)(2)], the "best scientific data available". NMFS is using "best available science" as a shorthand in these instances. The best available science requirement does not apply to all ESA decisions, such as 90-day findings on petitions to list species or to revise a critical habitat designation.

managers in agency analyses and decision-making. NMFS resource managers have identified seven key climate change considerations as those needing immediate attention and guidance - climate change emission scenarios; time periods for projecting anticipated climate change effects; addressing the adequacy of international and national policies and regulations; considerations for critical habitat designations; weighing the beneficial and adverse effects of actions; designing appropriate management action recommendations; and requirements in permitting and project designs. NMFS has developed the below guidance to address these needs.

Objectives

This procedure is supported by the analysis conducted by the NMFS Endangered Species Act and Climate Working Group Policy Subgroup and direct Regional Administrators with respect to the seven key climate change issues described above. This guidance will reduce confusion and duplication of effort, support greater consistency, efficiency, and effectiveness, and ultimately help the agency make better and more defensible ESA management decisions. As new information becomes available, NMFS will revisit and consider adjusting this guidance as needed. Regional Administrators should implement this guidance in coordination and consultation with the Office of Protected Resources (OPR).

The Guidance

Seven Policy Considerations

1. Consideration of future climate condition uncertainty

For ESA decisions involving species influenced by climate change, NMFS will use climate indicator values projected under the Intergovernmental Panel on Climate Change (IPCC)'s Representative Concentration Pathway 8.5 when data are available. When data specific to that pathway are not available, we will use the best available science that is as consistent as possible with RCP 8.5.

The IPCC's Fifth Assessment Report (AR5) presents four Representative Concentration Pathways (RCPs) to assess future climate changes, risks, and impacts. The RCPs are used for making projections based on population size, economic activity, lifestyle, energy use, land use patterns, technology, and climate policy. They describe four different 21st century pathways of greenhouse gas (GHG) emissions and atmospheric concentrations, air pollutant emissions, and land use: RCP 2.6, RCP 4.5, RC P6 and RCP 8.5. The four pathways cover a wide spectrum of GHG emission scenarios including significant reduction (RCP 2.6), two different stabilization levels (RCP 4.5 and RCP 6), and a continued increase (RCP 8.5). Of these, RCP 8.5 assumes that the fewest mitigation measures will be put into place. The IPCC did not identify any scenario as being more likely to occur than any other. However, as with any technical issue regarding resource management that involves uncertainties, we must choose a reasonable management approach that takes into account current knowledge and allows for revisiting the

approach as new information emerges. In cases of significant uncertainty, it is appropriate to assume conditions similar to the *status quo* until new information suggests a change is appropriate. Therefore, as a practical way forward, and consistent with the approach taken for the 2014 coral listing analysis and decision, we will evaluate conditions as projected under RCP 8.5 when data are available to allow such evaluation. When data specific to that pathway are not available, we will use information that is most consistent with the underlying direction of that pathway (*i.e.*, assuming a lower rather than higher level of effective mitigation efforts). Likewise, we assumed conditions similar to the *status quo* in our 2008-2012 listing analyses and decisions for ribbon, spotted, ringed, and bearded seals (although those analyses predated IPCC's development of the scenarios discussed in AR5).

2. Selecting a climate change projection timeframe

A. When predicting the future status of species in decisions under ESA Sections 4, 7, and 10, NMFS will project climate change effects for the longest time period over which we can reasonably foresee the effects of climate change on the species' status.

B. When evaluating effects of the action in Sections 7 and 10 decisions, NMFS will use the time period corresponding to the duration of direct and indirect effects of the action.

Current climate change information indicates that both uncertainty of climate projections and the degree of risk to many species from climate change increase over time. NMFS does not need to know with precision the magnitude of change over the relevant time period if the best available information allows NMFS to reasonably project the directionality of climate change and overall extent of effects to the species or its habitat. For decisions after the initial listing decision, NMFS is mindful to apply the principle of institutionalized caution which originates in legislative history of Section 7; however, it would be inappropriate to apply that principle, or the related concept of "benefit of the doubt," in the context of making a listing determination, because a species must first be determined to qualify for listing on the basis of the best available scientific and commercial information before the protections of the Act may be applied.

When dealing with Section 4 decisions *(e.g.*, listing and recovery), NMFS's policy guidance is to project effects over the longest possible period for which credible projections are available[2] in order to ensure the best available science is fully considered. For Sections 7 and 10 decisions, NMFS's policy guidance is to project climate effects over the timeframe of the action's direct and indirect effects. It will usually be the case that consideration is not limited to only the duration of the specified activity, but also to its continuing effects for the foreseeable future. For example, where a construction activity is the subject of consultation, we must consider not only the effects caused from the construction itself, but also the effects of the resulting structure once completed. Similarly, in the case of consultations on permits or other authorizations that are likely to be renewed, it can be appropriate to analyze the project over some period of time beyond the initial authorization period to the fullest extent possible (based on the information

[2] NMFS has used periods as long as 100 years for particular determinations. However, the appropriate time period will vary based on a particular species and threat.

available and the ability to predict impacts with an acceptable degree of accuracy).

3. Evaluating the adequacy of existing regulatory mechanisms to reduce greenhouse gas emissions

When addressing the adequacy of existing regulatory mechanisms in status reviews, listing decisions, and recovery plan analyses, NMFS will cite to or draw from previous NMFS findings, updated as appropriate in light of developments in this area, to describe the adequacy of existing global and national climate change regulatory mechanisms.

The "adequacy of existing regulatory mechanisms" is a factor for consideration in evaluating a species' status under section 4(a)(1)(D) of the ESA. The scientific consensus is that the main cause of climate change is GHG emissions. Reducing GHG emissions would require national and global efforts; therefore any consideration of the adequacy of existing regulatory mechanisms for species impacted by climate change must include consideration of the effectiveness of national and international regulatory mechanisms. NMFS is required to consider only existing mechanisms and whether those mechanisms are sufficient to counter the threat; we should not speculate about what kinds of regulation may be implemented in the future. Further, because information on developments in the area of national and international efforts to address climate change will not vary across NMFS regions or as relevant to specific NMFS decisions, it would not be efficient or informative to develop new analyses for each decision. Where the agency has already completed a thorough analysis that was based on a review of the then-current literature on climate change and has not been overtaken by significant new information, it is reasonable and efficient to cite to or draw from the existing analysis, updating it as appropriate. The 2014 corals listing decision, for example, reflects a thorough synthesis of the literature available through 2014. NMFS will consider revising this guidance as developments occur in this area.

4. Critical habitat designation in a changing climate

When designating critical habitat, NMFS will consider proactive designation of unoccupied habitat when there is adequate data to support a reasonable inference that the habitat is essential for the conservation of the species because of the function(s) it is likely to serve as climate changes.

Climate change is likely to modify habitats in ways that may make some previously occupied habitat unsuitable and some unoccupied habitat suitable. The ESA provides that unoccupied areas can be designated as critical habitat if such areas are essential for the conservation of the species. Information in the administrative record documenting likely impacts from climate change may support a determination that, for a particular species, unoccupied habitat is essential for its conservation. Areas outside the geographic area occupied by the species could become substantially more valuable for species conservation in the face of habitat changes and/or species movement prompted by climate change. As noted in the recent amendments to the joint regulations governing designation of critical habitat, climate change has made it more important to be proactive in designating unoccupied habitat as critical in appropriate cases. *See* 81 FR 7414 (Feb. 11, 2016).

5. Consideration of future beneficial effects

When NMFS is confident of the relative magnitude of both beneficial and adverse effects, the agency will treat them like any other effects; and when less confident of the relative magnitude of effects, it will give more weight to the negative effects to account for the consequences to the species of making a detrimental decision.

For certain species, climate change may result in some potentially beneficial effects such as, for example, new suitable habitat being created in northern, deeper, or higher elevation areas. Listing decisions, recovery plans, interagency consultations and other ESA decisions all must evaluate potentially beneficial or offsetting effects of climate change as part of the decision-making process. When the best available information is fairly certain as to the relative magnitude of beneficial to adverse effects, NMFS will treat them as either predominantly beneficial or adverse in accordance with that information; when uncertain of the relative magnitude of effects, more weight will be given to the detrimental effects in decisions made after the initial listing determination. This is consistent with the principle of institutionalized caution, discussed above.

6. Responsiveness and effectiveness of management actions in a changing climate

Where appropriate, NMFS section 7 consultations and section 10 permits covering a long time period during which climate change is likely to exacerbate the adverse effects of an action, should incorporate an adaptive management approach that includes:

- **adequate monitoring of climate and biological variables;**
- **identification of appropriate triggers related to those variables; and**
- **identification of protective measures that can be implemented without reinitiating when triggers are reached or, alternatively, identification of triggers that inform the decision to reinitiate.**

We are most certain of our treatment of climate change and the efficacy of responsive conservation actions in the near term. However, ESA decisions often require NMFS to make determinations regarding actions of long durations. Adaptive management approaches should be implemented, where appropriate, to allow NMFS to better respond to climate change effects over time. The agency will develop further guidance for each ESA action type to address the added uncertainty that climate change brings to those actions and whether and how adaptive management can be an effective tool to address these uncertainties over time.

7. Incorporating climate change into project designs

NMFS will review its internal guidance and structural design criteria *(e.g.*, West Coast Region Anadromous Salmonid Passage Facility Design Criteria) to ensure that the criteria are adequate for ESA-listed species in light of anticipated future climate conditions.

NMFS will analyze how effects on listed species from project designs may change over the life of the project, considering reasonably foreseeable climate change effects. NMFS will

consider how climate change can affect the degree to which projects NMFS evaluates under its statutory authorities may accommodate future as well as current needs of ESA-listed species. When structural criteria applied by other agencies are not sufficient, NMFS will engage with those agencies to attempt to find solutions.

Commonly in the context of section 7 consultations, NMFS must evaluate the effects of projects for which the action agency's proposed construction design has been based on historical environmental conditions. Projects constructed according to designs that do not anticipate future climate conditions may fail, causing adverse effects to listed species. Designs for structures as simple as a dock or as complex as a fish passage facility or a levee system may vary significantly and can have important consequences for species conservation. In evaluating the soundness of design criteria, NMFS will consider whether the project, once constructed, is likely to continue to serve its purposes relative to the conservation of listed species in light of changing climatic conditions into the foreseeable future.

Communication among NMFS regions and with action agencies on project design, as with many other issues relating to ESA implementation, can lead to adoption of more effective designs for numerous structures that present challenges in light of the likely effects of climate change. As a relatively new factor to consider in project design for species conservation, climate change provides an impetus for more efficient communication within NMFS and with action agencies. NMFS will place a high priority on collaboration regarding project design in the face of climate change.

Foundational Work

In 2008 NOAA conducted two workshops that focused on 1) climate and NOAA's living marine resource management requirements; and 2) strengthening NOAA's capacity to address marine and coastal impacts of climate change. A 2008 Technical Memorandum [3] was published that describes approaches to incorporating climate change into NOAA's stewardship responsibilities for living marine resources and coastal ecosystems. The Technical Memo called for the establishment of an ESA working group to develop standard operating procedures for incorporating climate impacts in NOAA's mandated management processes, specifically ESA actions.

The NMFS Endangered Species Act and Climate Working Group was established in 2010 as a result of the Technical Memo recommendation and was led by NOAA's Office of Science and Technology. Members included Headquarters and regional office representatives of Protected Resources, General Counsel and Habitat Conservation. The purpose of the group was to develop best scientific and technical practices for incorporating climate change into ESA decisions. The group found that in some cases legal and policy questions needed to be answered first if technical practices were to be used most effectively in management decisions. Until now, NMFS has had a variety of formal and less formal guidance documents to inform ESA implementation but none expressly to address climate change in ESA implementation.

The ESA's directive to use the best available science in certain decisions was the foundation of both the technical and policy approaches developed by the Climate Working Group and the Policy Subgroup. The group conducted case studies and evaluated current practices for integrating impacts of climate change science into ESA decisions, publishing their results in a special section of the journal *Conservation Biology*[4]. The case studies fell into three categories of ESA-related conservation planning: (1) long-term risk assessment *(e.g.*, decisions to list or de-list species or designate critical habitat); (2) long-term planning and prioritization *(e.g.*, recovery planning and conservation strategies); and (3) shorter-term projections and evaluation of immediate impacts *(e.g.*, action-specific evaluations).

Based on results of their studies, the Working Group identified a significant need for policy approaches to guide the use of scientific and technical information in cases where scientific uncertainty exists. Based on this recognition, the Working Group developed a paper "Legal and Policy Issues and Proposed Actions Regarding Climate Change and ESA Determinations" (April 2014) to identify specific questions to be answered by policy guidance to support agency resource managers make choices among potentially conflicting sources of information and data.

The Working Group paper identifies seven key climate change policy questions that have been identified by NMFS ESA managers that, if left unaddressed, will limit our ability to manage risk consistently and explain our decisions effectively. The paper recommends policy responses or further action needed to narrow the policy choice for these seven questions.

[3] Griffis, R. B., R. L. Feldman, N. K. Beller-Simms, K. E. Osgood, and N. Cyr (editors). 2008. Incorporating Climate Change into NOAA's Stewardship Responsibilities for Living Marine Resources and Coastal Ecosystems: A Strategy for Progress. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-95, 89 p.

[4] Conservation Biology. 2013. 27(6):1137-1233.

The NMFS Protected Resources Board reviewed the Working Group's paper and advised that the recommendations should be further developed and eventually become agency guidance. Based on the Working Group's questions, this guidance specifically addresses seven key policy considerations that are fundamental to addressing listing decisions, critical habitat determinations, recovery planning, Section 7 consultation, and other ESA decision-making.