

In Reply Refer To:
Mail Stop 104
#2008438-DO

MEMORANDUM

To: Director, Fish and Wildlife Service
Solicitor

From: Mark D. Myers */signed/*
Director, U.S. Geological Survey

Subject: The Challenges of Linking Carbon Emissions, Atmospheric Greenhouse Gas Concentrations, Global Warming, and Consequential Impacts

In response to a request from Dale Hall, Director, U.S. Fish and Wildlife Service, the U.S. Geological Survey has summarized some of the latest climate results from the science community in defining CO₂ loading from individual actions and specific biological responses. These results indicate that current science and models cannot link individual actions that contribute to atmospheric carbon levels to specific responses of species, including polar bears.

Output of Human-induced CO₂ from numerous sources is leading to greater concentrations of CO₂ and other greenhouse gases (GHG) in the Earth's atmosphere. The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Synthesis Report states:

Global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70% between 1970 and 2004.

Global Atmospheric concentrations of CO₂, methane, and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years.

Most of the observed increase in global average temperatures since the mid 20th century is very likely due to the observed increase in anthropogenic GHG concentrations. It is likely that there has been significant anthropogenic warming over the past 50 years averaged over each continent (except Antarctica).

Consequently,

Warming of the climate system is unequivocal, as is now evidenced from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level.

Past and current models regarding climate change and its subsequent impacts (including global warming-related sea ice loss) have primarily been developed at global to continental scales. GHG emissions, while occurring at point sources, are considered in these climate modeling studies to be representative of continental to global atmospheric composition.

The Climate Change Science Program's (CCSP) Synthesis and Assessment Product (SAP) 1.1, *Temperature Trends in the Lower Atmosphere*, states:

In an ideal world, there would be reliable quantitative estimates of all climate forcings- both natural and human induced- that have made significant contributions to surface and tropospheric temperature changes. We would have detailed knowledge of how these forcings had changed over space and time. Finally, we would have used standard sets of forcings to perform climate change experiments with a whole suite of numerical models thus isolating uncertainties arising from structural differences in the models themselves. Unfortunately, this ideal situation does not exist.

In regard to the linkage between climate change related warming and associated impacts, the IPCC Fourth Assessment states:

Difficulties remain in simulating and attributing observed temperature changes at smaller than continental scales.

The final conclusion that can be reached from this information is that human-induced global warming can be observed and verified at global to continental scales where cumulative GHG concentrations can be measured and modeled. Climate impacts, however, are observed at specific locations, at much more specific and localized scales--incongruent with the global scale of the aforementioned measured and modeled climate forces. It is currently beyond the scope of existing science to identify a specific source of CO₂ emissions and designate it as the cause of specific climate impacts at an exact location. This point is emphasized in the CCSP's SAP 1.1, *Temperature Trends in the Lower Atmosphere*:

The positive detection results obtained for GHG-only fingerprints were driven by model-data pattern similarities at very large spatial scales (e.g. at the scale of individual hemispheres, or land-vs.-ocean behavior). Fingerprint detection of GHG effects becomes more challenging at continental or sub-continental scales. It is at these smaller scales that spatially heterogeneous forcings, such as those arising from changes in aerosol loadings and land use patterns, may have large impacts on regional climate.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington, D.C. 20240



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Memorandum

To: Regional Directors, Regions 1-8

From: Director

Subject: Expectations for Consultations on Actions that Would Emit Greenhouse Gases

Recently, questions have been raised regarding compliance with section 7 of the Endangered Species Act concerning emissions of greenhouse gases (GHG), how these emissions contribute to global climate change, and any effects they may cause to listed species and designated critical habitats. These questions became evident as we analyzed the climate change information relevant to the polar bear listing determination. Based on our review of the information and issues considered during the analysis of the polar bear's status, I am writing to establish an analytical framework within which the Service will be able to assist Federal action agencies (including the Service itself when intra-Service consultation is appropriate) in achieving procedural and substantive compliance with the Act.

We recognize the primacy of a Federal action agency's role in determining how to conform its proposed actions to the requirements of section 7 and its responsibility to make the initial determination as to whether consultation is required on its action. As part of its ESA responsibilities, an action agency must examine the effects of its action in order to determine if consultation is necessary. Based on the attached memorandum to me from the Director of the U.S. Geological Survey, however, the Service does not anticipate that the mere fact that a Federal agency authorizes a project that is likely to emit GHG will require the initiation of section 7 consultation. Consultation is required for proposed Federal actions that may affect a listed species. The determination of whether consultation is triggered requires an examination of whether the direct and indirect effects of a particular action reach the regulatory threshold of "may affect". GHG that are projected to be emitted from a facility would not, in and of themselves, trigger section 7 consultation for a particular action unless it is established that the emissions from the proposed action cause an indirect effect to listed species or critical habitat. To constitute an indirect effect, the impact to the species must be later in time, must be caused by the proposed action, and must be reasonably certain to occur. The best scientific data available today do not allow us to draw a causal connection between GHG emissions from a given facility

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and effects posed to listed species or their habitats, nor are there sufficient data to establish that such impacts are reasonably certain to occur. Without sufficient data to establish the required causal connection—to the level of reasonable certainty—between a new facility's GHG emissions and impacts to listed species or critical habitat, section 7 consultation would not be required to address impacts of a facility's GHG emissions.

A question has also been raised regarding the possible application of section 7 to effects that may arise from oil and gas development activities conducted within the habitat of listed species. It is clear that any direct effects of oil and gas development operations, such as drilling activities, vehicular traffic to and from drill sites, and other on-site operational support activities that pose adverse effects to listed species and their critical habitat would need to be evaluated through the section 7 consultation process. It is also clear that any indirect effects from oil and gas development activities, such as impacts from the spread of contaminants (accidental oil spills, or the unintentional release of other contaminants) that are caused by the oil and gas development activities under consultation and that are reasonably certain to occur, (e.g., that are outside of the footprint of the action and spread into habitat areas used by listed species) would also need to be evaluated through the section 7 consultation process.

However, the future effects of any emissions that may result from the consumption of petroleum products refined from crude oil pumped from a particular drilling site would not constitute indirect effects and therefore would not be considered during section 7 consultations. The best scientific data available to the Service today do not provide the degree of precision needed to draw a causal connection between the oil produced at a particular drilling site, the GHG emissions that may eventually result from the consumption of the refined petroleum product, and a particular impact to listed species or their habitats. At present there is a lack of scientific or technical knowledge to determine a relationship between oil and gas leasing, development, or production activity and the effects of the ultimate consumption of petroleum products (GHG emissions). There are discernible limits to the establishment of a causal connection, such as uncertainties regarding the amount of production from a field; whether any or all of that production will be refined for plastics or other products that will not be burned; what mix of vehicles or factories might use the product; and what mitigation measures might offset consumption. Furthermore, there is no traceable nexus between the ultimate consumption of the petroleum product and any particular effect to listed species or their habitats. In short, the emissions effects resulting from the consumption of petroleum derived from an oil field would not constitute an indirect effect of any Federal agency action to approve the development of that field.

As we move into and adapt to this new field of consultations, we must recognize the needs of our fellow agencies for assistance and consultation in the broadest sense. While the foregoing discussion describes our expectations with regard to certain types of Federal actions, you need to be prepared to respond to any Federal agency that believes it may have a compliance duty under section 7 for its programs or actions affecting the production of GHGs. As new information and knowledge about emissions and specific impacts to species and their habitats is developed, we will adapt our framework for consultations accordingly. This is particularly important as more

regionally-based models are developed and refined to the level of specificity and reliability needed for the Service to execute its implementation of the Act's provisions ensuring consistency with the statute's best available information standard. Regional Directors are expected to brief the Director as these new models and sources of information ripen at the appropriate scale prior to incorporation into implementing the Act.

Any questions regarding this consultation should be directed to Bryan Arroyo, Assistant Director, Endangered Species, at (202) 208-4646.