



*Sent via U.S. Certified Mail and Facsimile*

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**RE: Notice of Violations of Section 4 of the Endangered Species Act Relating to the 12-Month Finding on a Petition to List Penguin Species as Threatened or Endangered**

This letter serves as a 60-day notice on behalf of the Center for Biological Diversity (“the Center”) and Turtle Island Restoration Network of our intent to sue the Department of the Interior and the United States Fish and Wildlife Service (“FWS”) over violations of section 4 of the Endangered Species Act (“ESA”), 16 U.S.C. § 1531 *et seq.*, for FWS’ unlawful finding that listing as threatened or endangered is not warranted for the emperor penguin (*Aptenodytes forsteri*), the northern rockhopper penguin (*Eudyptes moseleyi*), and southern rockhopper penguin (*Eudyptes chryscome*) throughout its entire range. *See* U.S.C. §§ 1533(a)(1), (b)(1) & (b)(3)(B).

In its finding, FWS failed to consider the best available science about climate change and penguin populations making the not warranted findings for emperor, northern and southern rockhopper penguins invalid. For example, FWS disregarded scientific evidence of climate change impacts on the emperor penguin, the most ice-dependant of all penguin species, which is threatened by global warming and the consequent loss of its sea-ice habitat and declining food availability. Instead, FWS concluded that global warming impacts were too “uncertain” to warrant protecting the species. FWS’ conclusion that listing is unwarranted for the emperor penguin violates the ESA’s requirement that listing decisions be based on the best available science. The not warranted findings for the northern rockhopper and southern rockhopper penguins are likewise invalid.

On December 18, 2008, FWS published its determination that listing the emperor penguin and the northern rockhopper penguin was not warranted through any part of their range, and listing the New Zealand/Australia Distinct Population Segment ("DPS") of the southern rockhopper penguin as threatened for the Campbell Plateau portion of its' range was warranted, but that listing the southern rockhopper throughout the remainder of its range was not warranted. *See* Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List Four Penguin Species as Threatened or Endangered Under the Endangered Species Act and Proposed Rule to List the Southern Rockhopper Penguin in the Campbell Plateau Portion of Its Range, 73 Fed. Reg. 77264.

As described below, the not warranted findings for the emperor penguin in all or part of its range, northern rockhopper penguin in all or part of its range, and southern rockhopper penguin throughout its range is arbitrary and capricious and otherwise unlawful because FWS failed to use the best available science as required by the ESA. Additionally, the finding was unsupported by evidence in the record; it misrepresented scientific studies, adopted inconsistent assessment strategies, and conducted flawed and inadequate analysis. This letter is provided pursuant to the 60-day notice requirement of the citizen suit provision of the ESA, to the extent that such notice is deemed necessary by a court. *See* 16 U.S.C. § 1540(g).

## **I. BACKGROUND**

The consequences of climate change on penguins, their prey, and their habitat are alarming and well-documented. The Antarctic Peninsula is among the most rapidly warming areas on the planet, and Antarctica on the whole is experiencing a warming trend (Clarke and Harris 2002). Additionally, the Southern Ocean is warming at a rate greater than the global average. *Id.* These warming trends are melting the icy habitat around Antarctica and changing ocean conditions that penguins and their prey depend upon. This overarching climate change threat combined with other threats, such as commercial fisheries, are imperiling the penguins that are the subject of this notice letter.

The emperor penguin is the largest living species of penguin, and it breeds in colonies along the sea ice along the coast of Antarctica. 73 Fed. Reg. at 77292. Unique among birds, the emperor penguins both breed and incubate their eggs during the Antarctic winter on the landfast Antarctic ice. *Id.* at 77292-93. The primary threat to the emperor penguin is the rapid melting of its Antarctic sea-ice habitat as a result of global warming. Carbon dioxide emissions are also acidifying the oceans and impacting species, such as krill and Antarctic silverfish, on which the emperor penguin depends.

Rockhopper penguins, in comparison, are among the smallest of the world's penguins, and are also the most widespread of the crested penguins (genus *Eudyptes*). 73 Fed. Reg. 77265. They are named for the way they hop from boulder to boulder in their rocky habitat. *Id.* Northern and southern rockhopper penguins range includes breeding habitat on temperate and sub-Antarctic islands. *Id.* at 77266

There are two subspecies of southern rockhopper penguins (*Eudyptes chrysocome*)

including a southern population (*E. c. chrysocome*) on the Falkland Islands, South Georgia and South American offshore islands, and an eastern population (*E. c. filholi*) that breeds on Crozet, Kerguelen, Prince Edward, Marion, Macquarie and the Sub-Antarctic islands of New Zealand (Jouventin et al. 2006). The southern rockhopper penguin faces numerous and diverse threats throughout its breeding and foraging ranges, the overriding factor driving population declines has been reduced prey availability linked to changing ocean conditions and commercial fisheries. 73 Fed. Reg. at 77268.

Northern rockhopper penguins (*Eudyptes moseleyi*) are found on the islands of the Tristan da Cunha region and Gough Island in the South Atlantic and St. Paul and Amsterdam Islands in the Indian Ocean. 73 Fed. Reg. at 77278. The northern rockhopper penguin is threatened by changing sea surface temperatures affecting its prey, among other things such as fisheries, egg collection, and predation. *Id.* at 77279-81.

On November 28, 2006, the Center submitted a formal, scientific petition to list 12 penguin species under the ESA (“Petition”). On July 11, 2007, FWS determined that the petition presented substantial scientific or commercial information to indicate that listing ten of the 12 penguin species as endangered or threatened may be warranted. Endangered and Threatened Wildlife and Plants; 90-day Finding on a Petition to List 12 Penguin Species as Threatened or Endangered under the Endangered Species Act, 72 Fed. Reg. 37695.

On December 18, 2008, as a result of a settlement with the Center, FWS finally made a “12-month” finding on four of the penguin species. 73 Fed. Reg. 77265. FWS concluded that ESA protection was not warranted for the emperor penguin, northern rockhopper penguin, and macaroni penguin; the latter is not a subject of this 60-day notice. *Id.* at 77264. While FWS proposed listing the New Zealand/Australia DPS of southern rockhopper penguin in the Campbell Plateau portion of its range as threatened, it found listing unwarranted for the southern rockhopper penguin in the remainder of its range. *Id.* These “not warranted” findings are not supported by the best available science and are therefore unlawful.

## **II. FWS’ “NOT WARRANTED” DETERMINATIONS FOR THE EMPEROR PENGUIN AND THE SOUTHERN AND NORTHERN ROCKHOPPER PENGUINS ARE ARBITRARY AND CAPRICIOUS**

The ESA requires FWS to determine whether a species is endangered or threatened based on “the present or threatened destruction, modification, or curtailment of its habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; or other natural or manmade factors affecting its continued existence.” 16 U.S.C. § 1533(a)(1). FWS must make determinations of whether a species is endangered or threatened solely on “the best scientific and commercial data available.” 16 U.S.C. § 1533(b)(1)(A).

FWS' failure to consider the best available science in its not warranted finding for ESA protection for emperor, northern and southern rockhopper penguins renders the determination invalid. See *Northern Spotted Owl, Seattle Audubon Society v. Hodel*, 716 F. Supp. 479, 482 (W.D. Wa. 1988) (holding that "an agency must set forth clearly the grounds on which it acted" and provide a satisfactory explanation for its action); *Center for Biological v. Lohn*, 296 F. Supp. 2d 1223, 1239 (W.D. Wa. 2003) (explaining that "[i]n the context of the ESA, the best available science standard gives the 'benefit of the doubt to the species'"); *Defenders of Wildlife v. Babbitt*, 958 F. Supp. 670, 680 ( D.D.C. 1997) (finding that the "best available data" standard requires much less than "conclusive evidence" under the ESA).

The court in *Center for Biological Diversity v. Lohn*, elaborated on this point, explaining that "[r]eliance upon the best available scientific data, as opposed to requiring absolute scientific certainty, 'is in keeping with congressional intent' that an agency 'take preventive measures *before* a species is 'conclusively' headed for extinction.'" 296 F. Supp. 2d at 1236. It is well established that "[t]o the extent that there is any uncertainty as to what constitutes the best available scientific information, Congress intended 'to give the benefit of the doubt to the species.'" *Center for Biological Diversity et al. v. Bureau of Land Management*, 422 F. Supp. 2d 1115, 1127 (N.D. Cal. 2006) (quoting *Conner*, 848 F.2d at 1454).

Here, FWS' finding both ignored the best available science and failed to give the species the benefit of the doubt. *NRDC v. Evans*, 364 F. Supp. 2d 1083, 1131 (N.D. Cal. 2003) (invalidating attempts to rewrite the best available science standard to "perfect science"). By misrepresenting and ignoring the best available science, FWS fails to comply with the requirements of the ESA. See also *Defenders of Wildlife v. Babbitt*, 958 F. Supp. 670 (D.D.C. 1997) (explaining that "the failure of [an] agency, despite the views of its own experts, to articulate a rational reason for its decision...establishes the arbitrary and capricious nature of the agency's decision-making").

**A. FWS FAILED TO USE THE BEST AVAILABLE SCIENCE CONCERNING CLIMATE CHANGE IMPACTS ON PENGUIN SPECIES.**

In each of the analyses of threats to the emperor, southern rockhopper and northern rockhopper penguins FWS failed to use the best available science concerning climate change and ocean acidification.

FWS did not use the best available science to determine present and future impacts of climate change on penguin species. At present, atmospheric carbon dioxide concentrations are around 386 parts per million ("ppm") and rising by 2 ppm annually. Past anthropogenic greenhouse gas emissions have altered the energy balance of the earth by  $0.85 \pm 0.15$  watts per square meter (Hansen et al. 2005). Due to the lag time in the climate system, this energy imbalance commits the earth to additional warming of .6° C (1° F) of warming that is already "in the pipeline," even absent additional greenhouse gas emissions (Hansen et al. 2005). Additionally, greenhouse gas emissions have continued

to increase and already emissions are outpacing the worst-case scenario predicted by the Intergovernmental Panel on Climate Change (“IPCC”) in 2007. The best available science on climate change shows that the planet is already committed to significant warming of air and sea surface temperature over the next century, yet the finding fails to incorporate adequate projections of climate change into its analysis.

FWS discounted science showing that Antarctica and the Southern Ocean are experiencing a warming trend that imperils the penguin species at issue here. The best available science demonstrates that the Antarctic is warming and that this is ongoing as a result of human activities with projections for further warming that will increase sea surface temperatures and loss of sea ice. Temperatures increased between 1950-2008 in most regions evaluated in Antarctica and, overall, Antarctica had a warming trend (Gilett et al. 2008). A recent 2009 study confirms this trend, Steig et al. (2009) reported a continent-wide warming trend in Antarctica between 1957 and 2006 of  $0.12 \pm 0.07$  °C per decade. On a regional basis, West Antarctica warmed at a rate of  $0.17 \pm 0.06$  °C per decade, the Antarctic Peninsula warmed at  $0.11 \pm 0.04$  °C per decade, and East Antarctica warmed at  $0.10 \pm 0.07$  °C per decade (1957–2006). Moreover, the projected trend for increased sea surface temperatures punctuates this threat (Bracegirdle et al. 2008). The Southern Ocean appears to be warming more rapidly than the global average, with a temperature increase of approximately  $0.17^{\circ}$  C ( $0.3^{\circ}$  F) observed between the 1950s and 1980s (Gille 2002; Chapin III 2005). The ecological consequences of the warming of Antarctica and the Southern Ocean threaten the survival of emperor and rockhopper penguins.

Climate impacts on the marine ecosystem are manifested through a variety of processes. First, rising global temperatures are reducing the sea-ice extent surrounding some areas of the Antarctic continent, particularly in the region of the Antarctic Peninsula (Ainley 2002). In turn, this reduction is affecting the base of the food chain, phytoplankton and krill (Atkinson et al. 2004). Second, even in areas outside of the Antarctic sea-ice region, global warming is causing reduced productivity in prey species while also causing prey to move further from shore, where penguins mainly forage. The principal study (Bracegirdle et al. 2008) that projects climate change over the Antarctic continent and Southern Ocean provides projections at a scale that is relevant to assessing impacts to penguins, and represents the state-of-the-science in using (and improving upon) the climate models of the IPCC Fourth Assessment to project future global and regional climate change. The use of IPCC climate models in projecting future global and regional climate change and impacts to species has been well established in the scientific literature by thousands of peer-reviewed publications. FWS inadequately considered climate change and ignored climate projection studies such as this, thus violating the best available science standard.

Additionally, FWS ignored the best available science on ocean acidification. The ocean’s uptake of anthropogenic carbon dioxide reduces the pH of seawater and causes it to become undersaturated with respect to calcium carbonate ions. Almost every species studied to date has had a negative response to ocean acidification, including species that are important to the penguin diet such as squid. Calcifying organisms, such as krill and

plankton that form the bottom of the marine food web, are threatened by ocean acidification, which impairs their growth. Due to the lower saturation state of the Southern Ocean it is particularly vulnerable to the impacts of ocean acidification, and scientists have already reported impacts of ocean acidification in Southern Ocean waters. Orr et al. (2005) projected that unabated carbon dioxide emissions and ocean acidification may begin to eliminate available aragonite in the Southern Ocean within the next 50 years. In addition, Cao and Caldeira (2008) projected how ocean acidification will affect the saturation state of aragonite and calcite in the Southern Ocean at different carbon dioxide stabilization levels. Consistent with prior studies, Cao and Caldeira (2008) predicted that the high latitude oceans would be the first to become undersaturated with respect to calcium carbonate with increasing atmospheric carbon dioxide concentrations, especially since aragonite and calcite saturation levels are naturally low in cold polar waters of the Antarctic. Strikingly, the researchers found that parts of the Southern Ocean (7% of the ocean area south of 60°S) would become under-saturated with respect to aragonite at a carbon dioxide stabilization level as low as 450 ppm. *Id.* At 550 ppm, half of the ocean south of 60°S would become under-saturated, and at 750 ppm, 95% of this area would become undersaturated. *Id.* Importantly, when the ocean becomes under-saturated with aragonite, aragonite-dependent organisms like pteropods will be unable to survive. Since pteropods form the basis of the diet for many other zooplankton and fish, penguins that prey on krill, fish, and squid would also be affected. The impacts of ocean acidification are already apparent in the Southern Ocean, a recent research study in the Southern Ocean found reduced shell weight in plankton over time “consistent with reduced calcification today induced by ocean acidification” (Moy et al. 2009).

The analysis of climate change threats on emperor penguins provides the best example of FWS’ failure to use the best available climate change science in its finding. It is undisputed that warming temperatures and the loss of sea ice pose a primary threat to the emperor penguin that depends on winter and spring landfast ice for breeding and summer pack ice and landfast ice for molting. Thus, the threat to the emperor penguin’s habitat due to climate change is central to the listing decision. Yet, FWS’ conclusion that the emperor penguin’s habitat is not threatened in any part of its range is arbitrary and capricious and is not supported by the best available science. FWS’ analysis of this threat factor is flawed and inadequate because it (1) failed to acknowledge anthropogenic climate change as a driver of habitat change in the Antarctic continent and Southern Ocean; (2) failed to consider and rely upon the best available science on observed and projected climate change and on the impacts of climate change to the emperor penguin; and (3) failed to acknowledge or analyze ocean acidification as a threat to the emperor penguin.

Anthropogenic climate change on the Antarctic continent and surrounding ocean has been cited as a threat to the emperor penguin by multiple scientific studies, including Ellis et al. (2004), Barber-Meyer et al. (2007), Ainley et al. (2008), Jenouvrier et al. (2005a). The best available science demonstrates that climate change threatens emperor penguin habitat as a result of increased surface temperature and loss of sea ice and that these changes affect penguin survival, breeding success, and timing of breeding (Jenouvrier et al. 2005a, Jenouvrier et al. 2005b, and Barbraud and Weimerskirch 2006,

Barbraud and Weimerskirch 2001). Importantly, the finding dismissed, without justification, the best available science of climate change on emperor penguins reported by Ainley et al. (2008) who used an ensemble of the IPCC Fourth Assessment Report climate models that best simulated observed climate change in the Southern Ocean to project sea-ice cover, wind speed, and temperature change for the Southern Ocean. With a rise in global annual mean surface temperature of 2°C above pre-industrial levels, the model ensemble projected a warming of the Southern surface ocean by >0.5°C and a decrease in annual mean sea-ice cover by 5-10% at 60°S and by 10-15% at 70°S. Based on the projected decreases in pack-ice coverage and ice thickness (particularly in the eastern Ross and Weddell Seas), Ainley et al. (2008) concluded that 50% of emperor penguin colonies (equivalent to 40% of the world population) that currently exist north of 70°S are in jeopardy of marked decline or disappearance.

FWS' finding on climate impacts on the habitat of the southern rockhopper is inconsistent. The impacts of sea surface temperature on food abundance and distribution described for the Campbell Plateau penguin similarly apply to the threats to the southern rockhopper penguins throughout its range. Climate-related changes in the marine environment have been linked to population declines at the Marion Island and Falkland Islands (Crawford et al. 2003, Crawford and Cooper 2003, Clausen and Huin 2003). Moreover, available science on future projections of global warming and ocean acidification impacts in the Southern Ocean point to further population declines.

The flawed and inadequate analyses provided by FWS on climate change impacts to emperor penguins, northern and southern rockhopper penguins fail to meet the “best available science” standard, and the findings thus violate the ESA.

## **B. CONCLUSIONS ON PENGUIN POPULATIONS CONTRADICTED EVIDENCE IN THE RECORD AND THE BEST AVAILABLE SCIENCE**

FWS also violated the ESA with respect to its findings on population status and trends with regard to southern rockhopper, northern rockhopper, and emperor penguins. The findings made conclusions that were not supported by the evidence in the record, were inconsistent, and failed to use the best available science.

First, FWS erroneously considered the southern rockhopper penguin as one species instead of two subspecies. The best available science indicates that southern rockhopper consists of two subspecies—if not full species. FWS found that taxonomic classifications for the rockhopper as either two or three species “have merit” and determined that it would “accept the BirdLife International treatment of the rockhopper penguin as two species: the northern rockhopper penguin (*E. moseleyi*) and the southern rockhopper penguin (*E. chrysocome*.” (73 Fed Reg. 77266). However, without discussion or justification, FWS failed to recognize the two subspecies of the southern rockhopper penguin (i.e. *E. c. chrysocome* and *E. c. filholi*) that are accepted by BirdLife International and established by the best-available science (BirdLife International 2008a). If FWS had properly identified these subpopulations, it is likely that would have altered

the agency's evaluation of the population status, threats, and significant portion of the range analysis. For example, FWS would be more likely to determine that a portion of the range is significant when performing its analysis on a subspecies level, since the total range size and population size would be significantly reduced at the subspecific level compared with the species level, making it more likely that portions would be determined to contribute meaningfully to representation, resiliency, or redundancy. Accordingly, a subpopulation specific review would more accurately reflect the risk of endangerment facing the southern rockhopper penguin.

Additionally, in its analysis of the Falkland Islands significant portion of the southern rockhopper range FWS' finding that population declines were inconclusive was inconsistent with the science in the record and relied upon by the agency. Overall, the best available science indicates that Falkland Island populations declined by 80% from 1933 to 1996, continued to decline in the past decade (1996-2006), and that there is no evidence to suggest that birds are relocating from the Falklands to the South American coast (Putz et al. 2003, Kirkwood et al. 2000, Putz et al. 2006). In addition, Putz et al. (2006) provided evidence that rockhopper penguins at the Falkland Islands are continuing to decline and have experienced recent episodes of mass die-offs. Thus, FWS' determination that it "cannot establish a continuing declining trend in numbers" for the Falkland Islands is not scientifically supported and does not follow the precautionary principle.

In its northern rockhopper finding that the population status was "uncertain" and "robust," FWS ignored the best available science cited in the finding that shows that the overall northern rockhopper population is declining across its range. FWS overestimates that there are "315,000-334,000 pairs" worldwide of northern rockhopper penguin (73 Fed. Reg. 77278), despite population estimates provided in the population analysis of the finding indicate that the worldwide population totals only 212,090 - 255,390 pairs. Also, in contrast to FWS' determination that the population trend is "uncertain," the science cited in the finding documented that the population is declining (BirdLife International 2008b). Moreover, a published study by Jouventin et al. (2006) cited by FWS stated that the northern rockhopper penguin population on Gough Island, which supports a significant portion of the population, has "recently undergone substantial declines" (citing unpublished data from Cuthbert). In a study released shortly thereafter, Cuthbert et al. (2009) reported a three-generation population decline of more than 50% from 1975-2005 on Gough Island and the Tristan da Cunha Island group, encompassing Tristan, Nightingale, and Inaccessible Islands:

Overall, declines at Gough, Tristan, Nightingale and Inaccessible islands indicate a three-generation decline of >50%. Taken in combination with recent decreases in Indian Ocean populations, the Northern Rockhopper Penguins is now categorised as globally 'Endangered.' (Cuthbert et al. 2009:1).

Finally, the finding ignored the best available science on population trends in the Indian Ocean on Amsterdam and St. Paul Islands that indicate a regional population decline

during 1971-1993(Guinard et al. 1998). Thus, FWS' determinations that "there appears to be no ongoing long-term decline" and that "the overall population appears robust" are not scientifically supportable.

With regard to the emperor penguin, FWS' conclusion that emperor penguin populations are stable contradicted scientific studies presented in the petition that document long-term declines in many parts of its range. While many emperor penguin colonies remain uncensused, available long-term data indicate significant historical declines that have occurred in colonies widely spread across the Antarctic continent (Barbraud and Weimerskirch 2001, Micol and Jouventin 2001, Marchant and Higgins 1990, Kooyman and Mullins 1990, Ainley et al. 2005).

The population declines already underway for emperor, northern rockhopper, and southern rockhopper penguins coupled with the best available climate science points to the conclusion that the survival of these penguins is threatened within the foreseeable future. The examples provided in this letter demonstrate some of the flaws in FWS' 12-month findings and demonstrate that the conclusions are invalid because they failed to use the best available science. For these reasons, among other examples, FWS is in violation of the ESA.

### **III. CONCLUSION**

FWS' determination that that the listing of the southern rockhopper penguin is not warranted except within a specific portion of its range, and that the listings of the northern rockhopper penguin and emperor penguin are not warranted violates the specific mandates of the ESA regarding how a determination as to whether to list a species is to be made. FWS' determinations are not based on the "best scientific and commercial data available," at times provides no explanation for its decisions, and often includes flawed and inadequate analysis. 16 U.S.C. § 1533(a)(1), (b)(1) & (b)(3)(B). FWS' determination is therefore arbitrary and capricious.

If FWS does not act within 60 days to correct this violation of the ESA, the Center and Turtle Island Restoration Network will pursue litigation in federal court against FWS and will seek injunctive and declaratory relief regarding these violations. If you have any questions, wish to discuss this matter, or believe this notice is in error, please contact me at (415) 436-9682 x 308 or [miyoko@biologicaldiversity.org](mailto:miyoko@biologicaldiversity.org).

Sincerely,



Miyoko Sakashita  
Staff Attorney

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