

Initial Screening of all Applications: All applications received in response to this announcement will be reviewed to determine whether or not they are complete and responsive to the scope of the stated objectives for each program. Incomplete or non-responsive applications will not be reviewed for technical merit. The Program will retain one copy of each non-responsive application for three years for record keeping purposes. The remaining copies will be destroyed.

Paperwork Reduction Act: The standard forms in the application kit involve a collection of information subject to the Paperwork Reduction Act. The use of Standard Forms 424, 424A, 424B, SF-LLL, CD-346, and SURF Program Student Applicant Information have been approved by OMB under the respective Control Numbers 0348-0043, 0348-0044, 0348-0040, 0348-0046, 0605-0001, and 0693-0042.

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

Research Projects Involving Human Subjects, Human Tissue, Data or Recordings Involving Human Subjects: Any proposal that includes research involving human subjects, human tissue, data or recordings involving human subjects must meet the requirements of the Common Rule for the Protection of Human Subjects, codified for the Department of Commerce at 15 CFR Part 27. In addition, any proposal that includes research on these topics must be in compliance with any statutory requirements imposed upon the Department of Health and Human Services (DHHS) and other federal agencies regarding these topics, all regulatory policies and guidance adopted by DHHS, FDA, and other Federal agencies on these topics, and all Presidential statements of policy on these topics.

NIST will accept the submission of human subjects protocols that have been approved by Institutional Review Boards (IRBs) registered with DHHS and performed by entities possessing a current, valid Federal-wide Assurance (FWA) from DHHS. NIST will not issue a single project assurance (SPA) for any IRB reviewing any human subjects protocol proposed to NIST.

On August 9, 2001, the President announced his decision to allow Federal funds to be used for research on existing

human embryonic stem cell lines as long as prior to his announcement (1) the derivation process (which commences with the removal of the inner cell mass from the blastocyst) had already been initiated and (2) the embryo from which the stem cell line was derived no longer had the possibility of development as a human being. NIST will follow guidance issued by the National Institutes of Health at <http://ohrp.osophs.dhhs.gov/humansubjects/guidance/stemcell.pdf> for funding such research.

Research Projects Involving Vertebrate Animals: Any proposal that includes research involving vertebrate animals must be in compliance with the National Research Council's "Guide for the Care and Use of Laboratory Animals" which can be obtained from National Academy Press, 2101 Constitution Avenue, NW., Washington, DC 20055. In addition, such proposals must meet the requirements of the Animal Welfare Act (7 U.S.C. 2131 *et seq.*), 9 CFR Parts 1, 2, and 3, and if appropriate, 21 CFR Part 58. These regulations do not apply to proposed research using pre-existing images of animals or to research plans that do not include live animals that are being cared for, euthanized, or used by the project participants to accomplish research goals, teaching, or testing. These regulations also do not apply to obtaining animal materials from commercial processors of animal products or to animal cell lines or tissues from tissue banks.

Limitation of Liability: Funding for the programs listed in this notice is contingent upon the availability of Fiscal Year 2009 appropriations under the Consolidated Appropriations Act, 2009 (Pub. L. 110-329). In no event will the Department of Commerce be responsible for proposal preparation costs if these programs fail to receive funding or are cancelled because of other agency priorities. Publication of this announcement does not oblige the agency to award any specific project or to obligate any available funds.

Executive Order 12866: This funding notice was determined to be not significant for purposes of Executive Order 12866.

Executive Order 13132 (Federalism): It has been determined that this notice does not contain policies with federalism implications as that term is defined in Executive Order 13132.

Executive Order 12372: Applications under this program are not subject to Executive Order 12372, "Intergovernmental Review of Federal Programs."

Administrative Procedure Act/Regulatory Flexibility Act: Notice and comment are not required under the Administrative Procedure Act (5 U.S.C. 553) or any other law, for rules relating to public property, loans, grants, benefits or contracts (5 U.S.C. 553 (a)). Because notice and comment are not required under 5 U.S.C. 553, or any other law, for rules relating to public property, loans, grants, benefits or contracts (5 U.S.C. 553(a)), a Regulatory Flexibility Analysis is not required and has not been prepared for this notice, 5 U.S.C. 601 *et seq.*

Dated: December 22, 2008.

Patrick Gallagher,

Deputy Director, NIST.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[Docket No. 080318443-81628-02]

RIN 0648-XG53

Endangered and Threatened Wildlife; Notice of 12-Month Finding on a Petition to List the Ribbon Seal as a Threatened or Endangered Species

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Status review; notice of finding.

SUMMARY: We, NMFS, announce a 12-month finding on a petition to list the ribbon seal (*Histiophoca fasciata*) as a threatened or endangered species under the Endangered Species Act of 1973 as amended (ESA). After a formal review of the best available scientific and commercial information, we find that listing of the ribbon seal is not warranted at this time. Although the ribbon seal population abundance is likely to decline gradually for the foreseeable future, primarily from slight but chronic impacts on reproduction and survival caused by reduced frequency of years with sea ice of suitable extent, quality, and duration of persistence, it is not in danger of extinction or likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

DATES: The finding announced in this notice was made on December 30, 2008.

ADDRESSES: Information used to make this finding is available for public inspection by appointment during

normal business hours at the office of NMFS Alaska Region, Protected Resources Division, 709 West Ninth Street, Room 461, Juneau, AK 99801. This file includes the status review report, information provided by the public, and scientific and commercial information gathered for the status review. The ribbon seal petition and the status review report can also be found at <http://www.fakr.noaa.gov/protectedresources/seals/ice.htm>.

FOR FURTHER INFORMATION CONTACT: James Wilder, NMFS Alaska Region, telephone (907) 271-6620; Kaja Brix, NMFS Alaska Region, (907) 586-7235; or Marta Nammack, NMFS, Office of Protected Resources, (301) 713-1401.

SUPPLEMENTARY INFORMATION: On December 20, 2007, we received a petition from the Center for Biological Diversity to list the ribbon seal as a threatened or endangered species under the ESA, primarily due to concern about threats to this species' habitat from climate warming and loss of sea ice. The Petitioner also requested that critical habitat be designated for ribbon seals concurrently with listing under the ESA. Section 4(b)(3)(B) of the ESA requires that when a petition to revise the List of Endangered and Threatened Wildlife and Plants is found to present substantial scientific and commercial information, we make a finding on whether the petitioned action is (a) not warranted, (b) warranted, or (c) warranted but precluded from listing by other pending proposals of higher priority. This finding is to be made within 12 months of the date the petition was received, and the finding is to be published promptly in the **Federal Register**.

After reviewing the petition, the literature cited in the petition, and other literature and information available in our files, we found that the petition met the requirements of the regulations under 50 CFR 424.14(b)(2) and determined that the petition presented substantial information indicating that the petitioned action may be warranted. This finding was published on March 28, 2008 (73 FR 16617). At that time, we commenced a status review of ribbon seals and solicited information pertaining to the species. We concurrently initiated status reviews of three other ice seals (ringed (*Phoca hispida*), bearded (*Erignathus barbatus*), and spotted (*Phoca largha*). These reviews are still ongoing. The status review of the ribbon seal is a compilation of the best available information concerning the status of ribbon seals, including the past, present, and future threats to this species. The

Biological Review Team (BRT) that conducted the status review was composed of scientists with expertise in the biology and ecology of ribbon seals and with expertise in fisheries from NMFS' Alaska Fisheries Science Center and a climate expert from NOAA's Pacific Marine Environmental Lab. The Status Review produced by the BRT was reviewed by four independent scientific experts, three of whom have expertise in the biology and ecology of Arctic marine mammal species, and specifically with ribbon seals, and the fourth expert is a climate scientist. The reviewers agreed with the conclusions of the status review and provided detailed comment, which the BRT addressed in the final draft of the document.

There are two key tasks associated with conducting an ESA status review. The first is to determine whether the petitioned entity qualifies as one or more species under the ESA; if so, or if we determine that there is a larger entity that includes the petitioned entity and qualifies as a species under the ESA, the second task is to conduct an extinction risk assessment to determine whether the species is threatened or endangered. The ESA defines the term endangered species as "any species which is in danger of extinction throughout all or a significant portion of its range." The term threatened species is defined as "any species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range." For this status review, the foreseeable future was determined to be the year 2050 because past and current emissions of greenhouse gases have already largely set the course for changes in the atmosphere and climate until that time, and because of enormous uncertainty about future social and political decisions on emissions that will dominate projection of conditions farther into the future. Beyond the year 2050, projections of climate scenarios are too heavily dependent on socio economic assumptions and are therefore too divergent for reliable use in assessing threats to ribbon seals.

It is important to note that our approach to establishing the appropriate time frame for the foreseeable future, as noted above, was the same as the approach used by the U.S. Fish & Wildlife Service (USFWS) in its recent decision listing the polar bear as threatened under the ESA (73 FR 28212). Although not relied on as the basis for determining "foreseeable future" in the polar bear listing, the USFWS also noted that the mid century threshold for reliable assessment of threats will occur in about three polar

bear generation lengths, or a total of 45 years from now, a measure that had been used previously by polar bear scientific expert groups as an appropriate time frame over which to evaluate polar bear population trends for determining the conservation status of the species. Coincidentally, the generation length of the ribbon seal (defined as the average age of the parents of an annual cohort or as the average age at which females give birth) is likely to be similar to that of the polar bear, approximately 12-15 years. However, for the reasons stated above related to the uncertainty in climate change projections beyond 2050, we believe that using 2050 as the foreseeable future is more appropriate with respect to ribbon seals than using a specific number of generation lengths to support or adjust the time frame for the foreseeable future. For species with overlapping generations, like the ribbon seal, facing threats that are primarily extrinsic, such as habitat destruction, commercial harvest, or incidental mortality in fisheries, the generation length may be essentially irrelevant; threats could undermine a population over the course of many generations or, conceivably, in less than one. Moreover, the time required to detect a specific change or trend in a population depends mostly on the precision of population estimates, not the generation time of the species. Therefore, and in summary, we determined that the best available scientific information allows reliable assessment of global warming and the related threats to ribbon seals through 2050. Further discussion of how the foreseeable future was defined for this analysis can be found in Section 4.1, Time Frame: The Foreseeable Future, of the Status Review of the Ribbon Seal.

Species Background

The ribbon seal is a strikingly marked member of the family Phocidae that primarily inhabits the Sea of Okhotsk, and the Bering and Chukchi Seas. This species is strongly associated with the sea ice during its whelping, mating, and pelage molt periods, from mid March through June. Most of the rest of the year is spent at sea; the species is rarely observed on land. The rates of survival and reproduction are not well known, but ribbon seals can live 20 to 30 years. They become sexually mature at 1 to 5 years of age, probably depending on environmental conditions, and adult females usually give birth every year to a single pup which is nursed for 3 to 4 weeks and then abandoned to fend for itself.

Species Delineation

The ESA provides for listing species, subspecies, or distinct population segments (DPSs) of vertebrate species. When we evaluate a petition to list an entity as threatened or endangered under the ESA, we must first determine whether the petitioned entity qualifies as a species under the ESA. The Petitioner requested that we list the ribbon seal species as threatened or endangered. When conducting a status review, we can also evaluate the status of DPSs of a vertebrate species to determine whether one or more warrant listing under the ESA.

The joint NMFS/ USFWS policy on the Recognition of Distinct Vertebrate Population Segments (DPS) Under the Endangered Species Act (61 FR 4722; February 7, 1996) describes two criteria that a population segment must meet in order to be considered a DPS: (1) discreteness from other conspecific population segments; and (2) significance to the taxon to which it belongs. Although there are two main breeding areas for ribbon seals, one in the Sea of Okhotsk and one in the Bering Sea, there is currently no evidence of discrete populations on which to base a separation into DPSs. Therefore, the entire global population was considered to comprise the species for the purpose of assessing extinction risk. More detail on this determination can be found in Section 3 of the Status Review, Species Delineation. In assessing extinction risk, the BRT considered whether any of the threats set forth below posed a risk to the species throughout all or a significant portion of its range, as a species may be endangered or threatened even if it is at risk in only a significant portion of its range.

Extinction Risk Assessment

To assess the extinction risk, the BRT evaluated the risks based on specific demographic factors of the species, such as abundance, productivity, spatial structure, and diversity, as these relate to the specific threats faced by the species outlined in section 4(a)(1) of the ESA. These threats are 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. We evaluated whether these factors caused a risk of extinction throughout all or a significant portion of the ribbon seal's range.

Demographic Factors

With a population likely comprising at least 200,000 individuals, ribbon seals are not currently at risk from the demographic issues of low abundance commonly associated with ESA listing decisions, such as demographic stochasticity, inbreeding, loss of genetic diversity, and compensatory effects. Aerial surveys were conducted in portions of the eastern Bering Sea by the National Marine Mammal Laboratory (NMML) in 2003, 2007, and 2008. The data from these surveys are currently being analyzed to construct estimates of abundance for the eastern Bering Sea from frequencies of sightings, ice distribution, and the timings of seal haul out behavior. In the interim, NMML researchers have developed a provisional population estimate of 49,000 ribbon seals in the eastern and central Bering Sea. Using restrictive assumptions, this number was scaled according to distributions of ribbon seal breeding areas in 1987 to produce total Bering Sea estimates ranging from 98,000 to 190,000. Similar scaling based on a rangewide distribution produced Bering Sea, Sea of Okhotsk, and total range estimates of 115,000, 100,000, and 215,000, respectively. The current population trend is unknown, but the recent estimate of 49,000 ribbon seals in the eastern and central Bering Sea is consistent enough with historical estimates to suggest that no major or catastrophic change has occurred in recent decades. The species is thought to occupy its entire historically observed range. There are no portions of their range in which ribbon seals have been reported to have disappeared, nor are they known to be demographically at risk in any portion of their range. Further detail on historic and current abundance and trends can be found in Section 2.9 of the ribbon seal status review.

Present or Threatened Destruction, Modification, or Curtailment of the Species' Habitat or Range

The main concerns about the conservation status of the ribbon seal stem from the likelihood that its sea ice habitat has been modified by the warming climate and, more so, that the scientific consensus projections are for continued and perhaps accelerated warming in the foreseeable future. A reliable assessment of the future conservation status of ribbon seals, therefore, requires a focus on projected changes to specific regional conditions, particularly sea ice, which could impact vital rates.

Unlike the Arctic Ocean, where sea ice is present year round, the ice in the Bering Sea and Sea of Okhotsk is seasonal in nature. The main thermodynamic physical influence at high latitudes is the cold and darkness that occurs in winter. Therefore, despite the recent dramatic reductions in Arctic Ocean ice extent during summer, the sea ice in the northern Bering Sea and Sea of Okhotsk is expected to continue forming annually in winter for the foreseeable future. The future central Arctic will also continue to be an ice covered sea in winter, but will contain more first year sea ice than multi year ice.

Ice extent in marginal seas such as the Bering Sea is characterized not by summer minima since these seas have been ice free in summer throughout recorded history but rather by winter maxima. Freezing conditions in the northern Bering Sea persist from December through April. Mean monthly maximum temperatures at Nome, Alaska (a sub Arctic maritime climate station located at 64° N), are -3°C or below for all months November through April. Freezing rather than thawing should still predominate in these months even if a hypothesized ~3° C global warming signal is realized. The result is that the seasonal formation of sea ice in the northern Bering Sea and Sea of Okhotsk is substantially decoupled from the summer ice extent in the Arctic Ocean, and is expected to continue annually through the foreseeable future, along with typical, large interannual variations in extent and duration of persistence.

Large areas of sea ice in the ribbon seal's range will form and persist in most years through May; the occurrence of extensive ice in June will be highly variable, as it has been in the past. Nevertheless, in association with a long term warming trend there will likely be changes in the frequency of years with extensive ice, the quality of ice, and the duration of its persistence that may impact the amount of suitable habitat in the geographic areas that ribbon seals have preferred in the past. An assessment of the risks posed by these changes must consider the ribbon seal life history functions associated with sea ice and the potential effects on the vital rates of reproduction and survival.

Despite the recent dramatic reductions in Arctic Ocean ice extent during summer, the sea ice in the northern Bering Sea and Sea of Okhotsk is expected to continue forming annually in winter for the foreseeable future. As mentioned above, the sea ice regimes in the Bering Sea and Sea of Okhotsk will continue to be subject to

large interannual variations in extent and seasonal duration, as they have been throughout recorded history. While there may be more frequent years in which sea ice coverage is reduced, the late March to early May period in which the peak of ribbon seal reproduction occurs will continue to have substantial ice for the foreseeable future. Still, there will likely be more frequent years in which the ice is confined to the northern regions of the observed breeding range.

In contrast to harp seals (*Pagophilus groenlandicus*), which are their closest relatives, ribbon seals are much less closely tied to traditional geographic locations for important life history functions such as whelping and molting. In years of low ice it is likely that ribbon seals will adjust, at least in part, by shifting their breeding locations in response to the position of the ice edge, as they have likely done in the past in response to interannual variability. For example, observations indicate that extreme dispersal of ribbon seals within their effective range is associated with years of unusual ice conditions. The formation of extensive ice in the Bering and Okhotsk Seas has been found to result in the occurrence of large numbers of these seals further south than they normally occur. The reverse is also true.

There has not been, however, any study that would verify whether vital rates of reproduction or survival have been affected by these interannual variations in ice extent and breeding. Whelping, nursing of pups, and maturation of weaned pups could conceivably be impacted in years when the ice does not extend as far south as it has typically in the past, because the breeding areas would be farther from the continental shelf break, a zone that seems to be a preferred foraging area during spring. If these conditions occur more frequently, as is anticipated from projections of future climate and sea ice conditions, reproduction and survival of young could be impacted. Lacking relevant data, the most conservative approach is to assume that the population has been at equilibrium with respect to conditions in the past, and that a change such as more frequent breeding farther from preferred foraging habitats will have some impact on vital rates. Even given the uncertainties, we conclude that the anticipated slight increase in frequency of years with low ice extent in April and May is likely to have some impact on reproductive rates.

As described in Section 2.5 of the status review, ribbon seals have an apparent affinity for stable, clean, moderate sized ice floes that are

slightly, but not deeply interior to the pack ice edge. For the foreseeable future, ice of this type is likely to occur annually in the Bering Sea and Sea of Okhotsk, but it may be confined more frequently to smaller areas, or areas farther north, than in the past. The availability of moderately thick, stable ice floes could potentially influence ribbon seal demography, particularly in May, via survival rates of weaned pups. Pups spend a great deal of time on the ice during a transition period of 2–3 weeks following weaning, presumably developing their capabilities for self-sufficient foraging. They enter the water regularly during this period, and therefore may not be particularly sensitive to modest reductions in ice coverage or quality. Thus, although they are likely dependent on ice, weaned pups may not require ice floes that can persist for weeks to meet their basic haul out needs. Though uncertain, it is possible that the weaned pups will be relatively limited in their capability to respond to rapidly deteriorating ice fields by relocating over large distances, a factor that could occur more frequently in the foreseeable future.

Subadult ribbon seals, which molt earlier than adults during March to mid May, and which are not constrained by habitat requirements for whelping and breeding, may be the least sensitive to the availability and quality of sea ice. For example, in 2007, NMFS research cruises in the Bering Sea encountered subadult ribbon seals in approximately the expected proportions. Of 31 ribbon seals caught, 6 were subadults, 22 were adults, and 3 were young of the year (which were commonly encountered but not always pursued for tagging). In other words, the obvious presence of seals in the subadult age class did not indicate that catastrophic losses had occurred in the ribbon seal cohorts produced during the warm years of 2001–2005.

Adult ribbon seals, which are the last to molt, might be expected to be the most sensitive to timing of the ice melt. Stable ice is critical during this period, and ribbon seals have been observed to rarely enter the water during this time. The pelage molt of phocid seals is generally thought to be facilitated or enhanced by elevated skin temperatures that can be achieved when hauled out versus in the water. For example, it has been suggested that the harbor seal (*Phoca vitulina*, a small phocid, similar in size and body composition to a ribbon seal), could not complete its molt entirely in the water at temperatures that the species would normally encounter in the wild. Analysis of haul out records (Section 2.6, Life History, of the status review) indicate that

individual adult ribbon seals haul out almost continuously for a period of 2–3 weeks, mostly during mid May to late June, corresponding to the observed peak in molting. Therefore, decreased availability of stable platforms for adults to complete their molt out of the water may also lower survival, but it is not currently possible to quantify this impact or the extent to which ribbon seals may adapt by shifting locations for molting.

Sea ice coverage in June will likely be low or absent more frequently in the foreseeable future. The implications of a loss of access to a haul out substrate during this period are unknown, but they may include energetic costs, increased susceptibility to skin disorders and pathogens, and possibly increased exposure to any risks from which the hair normally protects a seal (e.g., abrasion from crawling over snow and ice). However, the ultimate effect on adult survival rate is currently difficult or impossible to model.

These impacts on ribbon seal survival in years of low ice extent, poor ice quality, or early melting are all of a sort that would not necessarily be significant in any one year; a year of low ice extent seems unlikely to cause widespread mortality through disruption of the adult molt, or increased energetic costs for pups developing their foraging capabilities. Rather, the overall strength of the impacts is likely a function of the frequency of years in which they occur, and the proportion of the population's range over which they occur. Also, the effects on different age classes might be expected to be correlated, though not always in concert, because they involve ice characteristics at different times in the breeding molting period; low ice extent during breeding may not always be accompanied by early melting, and vice versa. As above, in the assessment of impacts on reproduction, we conclude that the anticipated slight increase in frequency of years with low ice extent in May and June is likely to have some impact on survival rates.

The extent to which ribbon seals will adapt to more frequent years with early ice melt by shifting the timing of reproduction and molting is unknown. Peak whelping dates of harbor seals at Tugidak Island, Alaska were 9–14 days earlier in 1964 and in the mid 1990s than in the late 1970s. The changes were unlikely to be caused by shifts in the age structure coupled with age specific differences in timing of reproduction, and therefore may have been a response to changes in environmental conditions. There are many examples in the scientific literature of shifts in the timing of reproduction by pinnipeds

and terrestrial mammals in response to body condition and food availability. In most of these cases, sub optimal conditions led to later reproduction, which would not likely be beneficial to ribbon seals as a phenotypic response to earlier spring ice melt. Over the longer term (i.e. beyond the foreseeable future) a shift to an earlier mean melt date may provide selection pressure for an evolutionary response over many generations toward earlier reproduction.

Several factors are noteworthy for their potential to mitigate the impacts on ribbon seals from predicted future sea ice scenarios. First, adult ribbon seals may be less constrained to a specific geographic area or region of the ice pack once breeding is complete, around the onset of the adult molt. They may therefore be capable of considerable shifts in distribution to ensure contact with suitable ice through the molt period, especially in the Bering Sea where there is access through the Bering Strait to the Chukchi Sea, in which ice persists more frequently in June. Second, the models on which we based our assessment of future ice conditions used a spatial resolution (~1° of latitude) that is much coarser than the scale at which ribbon seals are likely to interact with fields of sea ice. Model scenarios, and the remote sensed ice data that have been used to fit and tune the models, may depict zero ice in areas where ribbon seals remain capable of finding suitable ice. For example, in June 2008 the NOAA ship Oscar Dyson encountered a field of ice with numerous ribbon and spotted seals (*Phoca largha*) at 60°N near St. Matthew Island, an area where no ice was visible on the relatively high resolution (12.5 km) satellite images of sea ice for that day. And third, the age of maturation for females has been very low and pregnancy rates have been high in the recent past (Section 2.7, Vital Parameters, of the Status Review), implying that foraging conditions have been favorable, a scenario more likely to reflect population growth rather than equilibrium; if so, there may be some capacity to withstand a reduction in vital rates without incurring an actual population decline.

In summary, more frequent future years of reduced spring ice extent or ice quality could result in reduced vital rates of ribbon seal reproduction and survival. These potential impacts are premised on the assumption of a population at equilibrium with conditions in the recent (cooler) past and the related possibility that changes such as displacement of breeding locations or reduced availability of preferred ice types will have some

energetic costs that will ultimately be reflected in vital rates. In the absence of relevant data, it is not feasible to state the quantitative magnitude of the anticipated impacts. Considering both the potential impacts and the factors potentially conferring resilience, the BRT concluded that the net impacts will be slight but chronic and likely to cause a gradual decline in the ribbon seal population, but such decline is of insufficient magnitude to place it in danger of extinction throughout all or a significant portion of its range, now or within the foreseeable future.

In light of the recent decision to list the polar bear as threatened under the ESA, we note that the nature of ribbon seals' relationship to sea ice is different from that of polar bears in several significant respects. Ribbon seals' strong association with sea ice occurs in sub Arctic seas, whereas polar bears are distributed throughout most ice covered seas of the Northern Hemisphere, and particularly in the Arctic Ocean. The seasonal contrast in the two species' relationships with sea ice is also important. Ribbon seals use annually formed sea ice for reproduction and molting in the spring, but are largely unassociated with sea ice during summer, autumn, and early winter, whereas most polar bears remain on the sea ice year round or spend only short periods of time on land. Most polar bears rely on the persistence of sea ice over productive continental shelf waters, where they have both access to food (primarily ringed seals, *Phoca hispida*) within the sea ice habitat and proximity to terrestrial denning areas. Thus, the recent severe decline in the extent of summer sea ice, particularly multi year ice, of the Arctic Ocean was a primary factor in the conclusion that the polar bear should be considered threatened. The further retreat of the summer sea ice into the Arctic polar basin will force polar bears into increasingly marginal sea ice habitat over relatively unproductive polar basin waters, or into terrestrial areas lacking preferred prey and associated with increased competition and human interactions. The increasing separation between the summer ice edge and terrestrial denning areas will also subject polar bears to increased open water swimming and risk of drowning. Ribbon seals, on the other hand, are anticipated to experience little or no direct effects from the further retreat of summer sea ice in the Arctic polar basin, as they are primarily a pelagic, sub Arctic species during the summer months.

Ocean acidification, a result of increased carbon dioxide in the

atmosphere, may impact ribbon seal survival and recruitment through disruption of trophic regimes that are dependent on calcifying organisms. The nature and timing of such impacts are, however, extremely uncertain. Because of ribbon seals' apparent dietary flexibility (Section 2.8 of the status review, Feeding Habits) and because the major effects expected as a result of ocean acidification may not appear until the latter half of this century, this threat is of less immediate concern than the direct effects of sea ice degradation. Further details on ocean acidification can be found in Section 4.3.1.1.4.2 of the status review.

Changes in ribbon seal prey, anticipated in response to habitat changes resulting from ocean warming and loss of sea ice, have the potential for negative impacts, but these impacts are not well understood. Some changes already documented in the Bering Sea and the North Atlantic Ocean are of a nature that could be ameliorative or beneficial to ribbon seals. For example, several fish species, including walleye pollock (*Theragra chalcogramma*), a common ribbon seal prey, have shown northward distribution shifts and increased recruitment in response to warming, at least initially. These ecosystem responses may have very long lags as they propagate through trophic webs. The apparent flexibility in ribbon seal foraging locations and habits may make these threats of lower concern than more direct impacts from changes in sea ice.

The above analyses of the threats associated with impacts of global warming on ribbon seal habitat, to the extent that they may pose risks to ribbon seals, were presumed to manifest throughout the current breeding and molting range (for sea ice related threats) or throughout the entire range (for ocean warming and acidification) of the species, inasmuch as the finer scale spatial distribution of these threats is not currently well understood. The analysis did not indicate that any of these threats place the species in danger of extinction, now or in the foreseeable future, in a significant portion of its range or its entire range. More detailed information on the present or threatened destruction, modification, or curtailment of ribbon seals' habitat or range can be found in Section 4.3.1 of the status review.

Over-Utilization for Commercial, Subsistence, Recreational, Scientific, or Educational Purposes

Recreational, scientific, and educational utilization of ribbon seals is currently at very low levels and is not

projected to increase to significant threat levels in the foreseeable future. Commercial harvests by Russian sealers have at times been high enough to cause significant reductions in abundance and catch-per unit effort. The population apparently rebounded from a period of high harvest in the 1960s. Substantial but lower numbers were harvested for a few years in the early 1990s. Although Russian government quotas were recently put in place that would allow large harvests (~18,000 annually), the actual takes are low because of poor economic viability. There is some effort in Russia to develop new uses and markets for seal products, but unless this effort is successful, the harvest is unlikely to increase in the near future. Subsistence harvest levels have been low historically, but could potentially increase in the future if ribbon seals are forced to use a reduced and more northerly ice field, which could put them in closer proximity to Alaska Native communities near the Bering Strait. Changes in subsistence or commercial takes cannot be predicted with any certainty at this time. There is no indication that illegal harvests are occurring.

Diseases, Parasites, & Predation

A variety of pathogens (or antibodies), diseases, helminthes, cestodes, and nematodes have been found in ribbon seals. The prevalence of these agents is not unusual among seals, but the population impact is unknown. There may be an increased risk of outbreaks of novel pathogens or parasites as climate related shifts in species distributions lead to new modes of transmission. There is little or no direct evidence of significant predation on ribbon seals, and they are not thought to be a primary prey of any predators. Polar bears and killer whales may be the most likely opportunistic predators in the current sea ice regime, but walrus could pose a potentially greater risk if reduced sea ice conditions force these pagophilic (ice-loving) species into closer proximity in the future.

Inadequacy of Existing Regulatory Mechanisms

There is little evidence that the inadequacy of existing regulatory mechanisms currently poses a threat to ribbon seals throughout all or a significant portion of their range. However, there are no known regulatory mechanisms that effectively address global reductions in sea ice habitat at this time. Also, it is unclear what regulatory mechanisms are in place to ensure that potential commercial

harvests in Russia are conducted in a sustainable fashion.

Other Natural or Manmade Factors Affecting the Species' Continued Existence

Although some pollutants are elevated in ribbon seals, there is no conspicuous evidence of toxicity or other significant impacts to the species throughout all or a significant portion of its range. Continued and expanded monitoring would be prudent to document any trends in the contaminants of greatest concern.

Oil and gas exploration and development activities may include artificial island construction, drilling operations, pipeline construction, seismic surveys, and vessel and aircraft operations. The main issues for evaluating the impacts of exploration and development activities on ribbon seals are the effects of noise, disturbance, and potential oil spills produced from these activities. Any negative effects on ribbon seals from noise and disturbance associated with development activities are likely to be minor and localized. Ribbon seals are also highly dispersed during the summer, open water season, so the rate of interactions with seismic surveys would likely be low, and, in any case, seals have not been shown to be significantly impacted by oil and gas seismic surveys. The threat posed to ribbon seals by oil spills will increase if offshore oil and gas development and shipping activities increase across their range as predicted. The potential impacts would be greatest during April June when the seals are relatively aggregated, and substantially lower during the remainder of the year when they are dispersed in the open water throughout the North Pacific Ocean, Sea of Okhotsk, and Bering and Chukchi Seas.

Estimates from observed bycatch in commercial fisheries indicate that less than 200 ribbon seals per year are taken, though mortalities are certainly under reported in some fisheries. However, this level of estimated bycatch of ribbon seals represents less than 0.1% of their estimated population. Because there is little or no fishery activity near aggregations of ribbon seals when they are associated with ice, and they are highly dispersed during the remainder of the year, bycatch is unlikely to be a significant threat to ribbon seal populations. For the same reason, competition from fisheries that reduce local abundance of ribbon seal prey is unlikely to be significant. Broad scale reduction in a commercially fished, primary prey species could have a

significant impact, but the large groundfish fisheries in Alaskan waters are managed to prevent depletion of the stocks.

The extraordinary reduction in Arctic sea ice that has occurred in recent years has renewed interest in trans Arctic navigation routes connecting the Atlantic and Pacific Oceans via the Northwest Passage and the Northern Sea Route. The Chukchi Sea and Bering Strait would be the most likely areas for increased exposure of pelagic ribbon seals to ship traffic, because of the geographic constriction and the seasonal migration of part of the ribbon seal population around the beginning and end of the ice-free season. However, there is currently little or no information on direct impacts from shipping on seals in open water. Ribbon seals hauled out on sea ice may also be at risk from increased ship traffic, but likely only during spring and early summer, and then only by ice reinforced ships. Assessing risk from increases in shipping and transportation is difficult because projections about future ship trends within the ribbon seal's range are currently unavailable.

Several of the threats considered in this section were associated with specific regions or times of year when ribbon seal distribution is restricted, such as increased ship traffic in the Bering Strait region or oil and gas activities during the ribbon seal breeding and molting seasons. If such threats were to occur and cause a high rate of mortality or forgone reproduction, the species could be considered threatened or endangered in a significant portion of its range. However, none of the threats considered here is presently considered to be both sufficiently likely to occur and sufficiently high in impact, alone or cumulatively, to raise concern about them posing a risk of ribbon seal extinction or becoming endangered throughout a significant portion of its range.

Conservation Efforts

When considering the listing of a species, section 4(b)(1)(A) of the ESA requires consideration of efforts by any state, foreign nation, or political subdivision of a state or foreign nation to protect the species. Such efforts would include measures by Native American tribes and organizations, local governments, and private organizations. Also, Federal, tribal, state, and foreign recovery actions (16 U.S.C. 1533(f)), and Federal consultation requirements (16 U.S.C. 1536) constitute conservation measures. On March 28, 2003, NMFS and the U.S. Fish and Wildlife Service

(USFWS) published the final Policy for Evaluating Conservation Efforts (PECE)(68 FR 15100). The PECE provides guidance on evaluating current protective efforts identified in conservation agreements, conservation plans, management plans, or similar documents (developed by Federal agencies, state and local governments, tribal governments, businesses, organizations, and individuals) that have not yet been implemented, or that have been implemented but have not yet demonstrated effectiveness. The PECE establishes two basic criteria for evaluating current conservation efforts: (1) the certainty that the conservation efforts will be implemented, and (2) the certainty that the efforts will be effective. The PECE provides specific factors under these two basic criteria that direct the analysis of existing conservation efforts.

The PECE identifies a number of factors to consider when evaluating the certainty an effort will be implemented. These include whether: the necessary resources (e.g., funding and staffing) are available; the necessary agreements have been formalized such that the required authority and regulatory mechanisms are in place; there is a schedule for completion and evaluation of the stated objectives; and (for voluntary efforts) the necessary incentives are in place to ensure adequate participation. The evaluation of the certainty of an effort's effectiveness is made on the basis of whether the effort or plan: (1) establishes specific conservation objectives; (2) identifies the necessary steps to reduce threats or factors for decline; (3) includes quantifiable performance measures for the monitoring of compliance and effectiveness; (4) incorporates the principles of adaptive management; and (5) is likely to improve the species' viability at the time of the listing determination.

The PECE identifies several important stipulations. Satisfaction of the criteria for implementation and effectiveness establishes a given conservation effort as a candidate for consideration, but does not mean that the effort will ultimately change the risk assessment. The PECE stresses that, just as listing determinations must be based on the viability of the species at the time of review, they must also be based on the state of protective efforts at the time of the listing determination. There are circumstances where threats are so imminent, widespread, and/or complex that it may be impossible for any

agreement or plan to include sufficient efforts to result in a determination that listing is not warranted.

At this time, we are not aware of any formalized conservation efforts for ribbon seals that have yet to be implemented, or which have recently been implemented, but have yet to show their effectiveness in removing threats to the species. NMFS co-manages ribbon seals with the Ice Seal Committee (ISC), which is an Alaska Native Organization dedicated to conserving seal populations, habitat, and hunting in order to help preserve native cultures and traditions. The ISC co-manages ice seals with NMFS by monitoring subsistence harvest and cooperating on needed research and education programs pertaining to ice seals. Our National Marine Mammal Lab is engaged in an active research program for ribbon seals. The new information from research will be used to enhance our understanding of the risk factors affecting ribbon seals, thereby improving our ability to develop effective management measures for the species.

ESA section 4(b)(1)(B) requires us to give consideration to species which have been designated as requiring protection from unrestricted commerce by any foreign nation, or pursuant to any international agreement; or identified as in danger of extinction, or likely to become so within the foreseeable future, by any state agency or any agency of a foreign nation that is responsible for the conservation of the species. We are not aware of any such special protections or designations, or of any conservation efforts undertaken by foreign nations specifically to protect ribbon seals. Ribbon seals are not afforded any protective measures or special status via the Convention for the International Trade in Endangered Species or the International Union for Conservation of Nature.

In consideration of all of the threats and potential threats identified above, the assessment of the risks posed by those threats, the possible cumulative impacts, and the uncertainty associated with all of these, we draw the following conclusions: (1) Ribbon seals are not in current danger of extinction throughout all or a significant portion of their range; (2) the abundance of the ribbon seal population is likely to decline gradually for the foreseeable future, primarily from slight but chronic impacts on reproduction and survival caused by reduced frequency of years with sea ice of suitable extent, quality, and duration of persistence; (3) despite the

expectation of a gradual decline, ribbon seals are not likely to become an endangered species within the foreseeable future throughout all or a significant portion of their range.

We have reviewed the status of the ribbon seal, considering the best scientific and commercial data available. We have given consideration to conservation efforts and special designations for ribbon seals by states and foreign nations. Consideration of the ESA section 4(a)(1) factors in the context of the biological status of the species indicates that the species is not in danger of extinction throughout all or a significant portion of its range, nor is it likely to become so in the foreseeable future. We believe that the ribbon seal does not meet the ESA definition of an endangered or threatened species; therefore, the listing of ribbon seals under the ESA is not warranted at this time. However, we will continue to monitor the status of the ribbon seal. If conditions change in the future, we will re-evaluate the status of this species to determine whether it should be listed as threatened or endangered under the ESA. Because of the remaining uncertainties regarding the effects of climate change, sea ice cover, and potential Russian harvests, we will add the ribbon seal to our Species of Concern list (<http://www.nmfs.noaa.gov/pr/species/concern/#list>; See 69 FR 19975, April 15, 2004 for description of program). This will serve to (1) increase public awareness about the species; (2) further identify data deficiencies and uncertainties in the species' status and the threats it faces; (3) and stimulate cooperative research efforts to obtain the information necessary to evaluate the species' status and threats. As resources permit, we will conduct further studies of ribbon seal abundance and status. We will evaluate results of these and any other studies that may be conducted and undertake a new status review, if warranted.

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: December 22, 2008.

Samuel D. Rauch III,

*Deputy Assistant Administrator for
Regulatory Programs, National Marine
Fisheries Service.*

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