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Endangered and Threatened Species; Threatened Status for the Arctic, Okhotsk, and Baltic Subspecies of the Ringed Seal and Endangered Status for the Ladoga Subspecies of the Ringed Seal; Final Rule

**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**50 CFR Parts 223 and 224**

**[Docket No. 101126590–2478–03]**

**RIN 0648–XZ59**

## Endangered and Threatened Species; Threatened Status for the Arctic, Okhotsk, and Baltic Subspecies of the Ringed Seal and Endangered Status for the Ladoga Subspecies of the Ringed Seal

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

**ACTION:** Final rule.

**SUMMARY:** We, NMFS, issue a final determination to list the Arctic (*Phoca hispida hispida*), Okhotsk (*Phoca hispida ochotensis*), and Baltic (*Phoca hispida botnica*) subspecies of the ringed seal (*Phoca hispida*) as threatened and the Ladoga (*Phoca hispida ladogensis*) subspecies of the ringed seal as endangered under the Endangered Species Act (ESA). We will propose to designate critical habitat for the Arctic ringed seal in a future rulemaking. To assist us in this effort, we solicit information that may be relevant to the designation of critical habitat for Arctic ringed seals. In light of public comments and upon further review, we are withdrawing the proposed ESA section 4(d) protective regulations for threatened subspecies of the ringed seal because we have determined that such regulations are not necessary or advisable for the conservation of the Arctic, Okhotsk, or Baltic subspecies of the ringed seal at this time. Given their current population sizes, the long-term nature of the primary threat to these subspecies (habitat alteration stemming from climate change), and the existing protections under the Marine Mammal Protection Act, it is unlikely that the proposed protective regulations would provide appreciable conservation benefits.

**DATES:** This final rule is effective on February 26, 2013. Replies to the request for information regarding designation of critical habitat for Arctic ringed seals must be received by February 26, 2013.

**ADDRESSES:** You may submit comments and information related to the identification of critical habitat for the Arctic ringed seal to Jon Kurland, Assistant Regional Administrator for Protected Resources, Alaska Region, NMFS, Attn: Ellen Sebastian. You may submit this information, identified by FDMS Docket Number NOAA–NMFS–2010–0258, by any one of the following methods:

- *Electronic Submissions:* Submit all electronic public comments via the Federal eRulemaking Portal *http://www.regulations.gov*. To submit information via the e-Rulemaking Portal, first click the ''submit a comment'' icon, then enter NOAA–NMFS–2010–0258 in the keyword search. Locate the document you wish to comment on from the resulting list and click on the ''Submit a Comment'' icon on the right of that line.
- *Mail:* Submit written comments to P.O. Box 21668, Juneau, AK 99802.
- *Fax:* (907) 586–7557.
- Hand delivery to the Federal Building: 709 West 9th Street, Room 420A, Juneau, AK.

Comments must be submitted by one of the above methods to ensure that the comments are received, documented, and considered by NMFS. Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered.

All comments received are a part of the public record and will generally be posted for public viewing on *www.regulations.gov* without change. All personal identifying information (*e.g.,* name, address, etc.) submitted voluntarily by the sender may be publicly accessible. Do not submit confidential business information, or otherwise sensitive or protected information.

NMFS will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous). Attachments to electronic comments will be accepted in Microsoft Word or Excel, WordPerfect, or Adobe PDF file formats only.

**FOR FURTHER INFORMATION CONTACT:** Tamara Olson, NMFS Alaska Region, (907) 271–5006; Jon Kurland, NMFS Alaska Region, (907) 586–7638; or Marta Nammack, NMFS Office of Protected Resources, (301) 427–8469.

**SUPPLEMENTARY INFORMATION:**

### Background

On March 28, 2008, we initiated status reviews of ringed, bearded (*Erignathus barbatus*), and spotted seals (*Phoca largha*) under the ESA (73 FR 16617). On May 28, 2008, we received a petition from the Center for Biological Diversity to list these three species of seals as threatened or endangered under the ESA, primarily due to concerns about threats to their habitat from climate warming and loss of sea ice. The petitioner also requested that critical habitat be designated for these species concurrently with listing under the ESA. In response to the petition, we published a 90-day finding that the petition presented substantial scientific or commercial information indicating that the petitioned action may be warranted (73 FR 51615; September 4, 2008). Accordingly, we prepared status reviews of ringed, bearded, and spotted seals and solicited information pertaining to them.

On September 8, 2009, the Center for Biological Diversity filed a lawsuit in the U.S. District Court for the District of Columbia alleging that we failed to make the requisite 12-month finding on its petition to list the three seal species. Subsequently, the Court entered a consent decree under which we agreed to finalize the status review of the ringed seal (and the bearded seal) and submit a 12-month finding to the Office of the Federal Register by December 3, 2010. Following completion of a status review report and 12-month finding for spotted seals in October 2009 (74 FR 53683; October 20, 2009; see also 75 FR 65239; October 22, 2010), we established Biological Review Teams (BRTs) to prepare status review reports for ringed and bearded seals.

The status review report for the ringed seal (Kelly *et al.,* 2010a) is a compilation of the best scientific and commercial data available concerning the status of the species, including identification and assessment of the past, present, and future threats to the species. The BRT that prepared this report was composed of eight marine mammal biologists, a fishery biologist, a marine chemist, and a climate scientist from NMFS's Alaska and Northeast Fisheries Science Centers, NOAA's Pacific Marine Environmental Lab, and the U.S. Fish and Wildlife Service (FWS). The status review report underwent independent peer review by five scientists with expertise in ringed seal biology, Arctic sea ice, climate change, and ocean acidification.

The BRT reviewed the best scientific and commercial data available on the ringed seal's taxonomy and concluded that there are five currently recognized subspecies of the ringed seal: Arctic ringed seal; Baltic ringed seal; Okhotsk ringed seal; Ladoga ringed seal; and Saimaa ringed seal (which previously was listed as endangered under the ESA; 58 FR 26920; May 6, 1993).

On December 10, 2010, we published in the **Federal Register** a 12-month finding and proposed to list the Arctic, Okhotsk, Baltic, and Ladoga subspecies

of the ringed seal as threatened (75 FR 77476). We also concluded in that finding that the Saimaa subspecies of the ringed seal remains in danger of extinction, consistent with its current listing as endangered under the ESA. We published a 12-month finding for bearded seals as a separate notification concurrently with this finding (75 FR 77496; December 10, 2010), and proposed to list two population segments of bearded seals as threatened.

On December 13, 2011, we published in the **Federal Register** a document announcing a 6-month extension of the deadline for a final listing determination to address substantial disagreement relating to the sufficiency or accuracy of the model projections and analysis of future sea ice, and in particular snow cover, for Arctic ringed seals (76 FR 77466). At that time we also announced that to address the disagreement and better inform our final determination, we would conduct a special independent peer review of the sections of the status review report over which there was substantial disagreement. We subsequently conducted this special peer review and made available for comment the resulting peer review report (NMFS, 2012) that consolidated the comments received (77 FR 20773; April 6, 2012).

**ESA Statutory, Regulatory, and Policy Provisions**

Two key tasks are associated with conducting an ESA status review. The first is to identify the taxonomic group under consideration; and the second is to conduct an extinction risk assessment to determine whether the petitioned species is threatened or endangered.

To be considered for listing under the ESA, a group of organisms must constitute a ''species,'' which section 3(16) of the ESA defines to include ''any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.'' The term ''distinct population segment'' (DPS) is not commonly used in scientific discourse, so FWS and NMFS developed the ''Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act'' to provide a consistent interpretation of this term for the purposes of listing, delisting, and reclassifying vertebrates under the ESA (61 FR 4722; February 7, 1996). The five subspecies of the ringed seal qualify as ''species'' under the ESA. In the *Summary of Comments and Responses* below, we discuss the application of the DPS policy to the ringed seal subspecies.

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.'' The foreseeability of a species' future status is case specific and depends upon both the foreseeability of threats to the species and foreseeability of the species' response to those threats. When a species is exposed to a variety of threats, each threat may be foreseeable over a different time frame. For example, threats stemming from well-established, observed trends in a global physical process may be foreseeable on a much longer time horizon than a threat stemming from a potential, though unpredictable, episodic process such as an outbreak of disease that may never have been observed to occur in the species.

The principal threat to ringed seals is habitat alteration stemming from climate change. In the 2008 status review for the ribbon seal (Boveng *et al.,* 2008; see also 73 FR 79822, December 30, 2008), NMFS scientists used the same climate projections used in our risk assessment for ringed seals (which is summarized in the preamble to this final rule), and analyzed threats associated with climate change through 2050. One reason for that approach was the difficulty of incorporating the increased divergence and uncertainty in climate scenarios beyond that time. Other reasons included the lack of data for threats other than those related to climate change beyond 2050, and the fact that uncertainty embedded in the assessment of the ribbon seal's response to threats increased as the analysis extended farther into the future.

Since completing the analysis for ribbon seals, with its climate impact analysis, NMFS scientists have revised their analytical approach to the foreseeability of threats due to climate change and responses to those threats, adopting a more threat-specific approach based on the best scientific and commercial data available for each respective threat. For example, because the climate projections in the Intergovernmental Panel on Climate Change's (IPCC's) *Fourth Assessment Report* (AR4; IPCC, 2007) extend through the end of the century (and we note the IPCC's *Fifth Assessment Report* (AR5), due in 2014, will extend even farther into the future), for our analysis of ringed seals we used the same models to assess impacts from climate change through 2100. We continue to recognize that the farther into the future the analysis extends, the greater the inherent uncertainty, and we incorporated that limitation into our assessment of the threats and the species' response. For other threats, where the best scientific and commercial data do not extend as far into the future, such as for occurrences and projections of disease or parasitic outbreaks, we limited our analysis to the extent of such data. This threat-specific approach creates a more robust analysis of the best scientific and commercial data available. It is also consistent with the memorandum issued by the Department of Interior, Office of the Solicitor, regarding the meaning of the term ''foreseeable future'' (Opinion M–37021; January 16, 2009).

NMFS and FWS recently published a draft policy to clarify the interpretation of the phrase ''significant portion of the range'' in the ESA definitions of ''threatened'' and ''endangered'' (76 FR 76987; December 9, 2011). The draft policy consists of the following four components:

1. If a species is found to be endangered or threatened in only a significant portion of its range, the entire species is listed as endangered or threatened, respectively, and the ESA's protections apply across the species' entire range.

2. A portion of the range of a species is ''significant'' if its contribution to the viability of the species is so important that, without that portion, the species would be in danger of extinction.

3. The range of a species is considered to be the general geographical area within which that species can be found at the time FWS or NMFS makes any particular status determination. This range includes those areas throughout all or part of the species' life cycle, even if they are not used regularly (*e.g.,* seasonal habitats). Lost historical range is relevant to the analysis of the status of the species, but cannot constitute a significant portion of a species' range.

4. If the species is not endangered or threatened throughout all of its range, but it is endangered or threatened within a significant portion of its range, and the population in that significant portion is a valid DPS, we will list the DPS rather than the entire taxonomic species or subspecies.

The Services are currently reviewing public comment received on the draft policy. While the Services' intent ultimately is to establish a legally binding interpretation of the term ''significant portion of the range,'' the draft policy does not have legal effect until such time as it may be adopted as final policy. However, the discussion

and conclusions set forth in the draft policy are consistent with NMFS's past practice as well as our understanding of the statutory framework and language. We have therefore considered the draft policy as non-binding guidance in evaluating whether to list the Arctic, Okhotsk, Ladoga, and/or Baltic subspecies of the ringed seal under the ESA.

**Species Information**

A thorough review of the taxonomy, life history, and ecology of the ringed seal is presented in the status review report (Kelly *et al.,* 2010a; available at *http://alaskafisheries.noaa.gov/*). This information, along with an analysis of species delineation and DPSs, was summarized in the preamble to the proposed rule (75 FR 77476; December 10, 2010) and will not be repeated here.

**Summary of Factors Affecting the Ringed Seal**

Section 4(a)(1) of the ESA and the listing regulations (50 CFR part 424) set forth procedures for listing species. We must determine, through the regulatory process, if a species is endangered or threatened because of any one or a combination of the following factors: (1) The present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or human-made factors affecting its continued existence. The preamble to the proposed rule discussed each of these factors for each subspecies of the ringed seal (75 FR 77476; December 10, 2010). That discussion will not be repeated in its entirety here, but we provide a summary for each of the factors below. Section 4.2 of the status review report provides a more detailed discussion of the factors affecting the five subspecies of the ringed seal (see **ADDRESSES**). The data on ringed seal abundance and trends of most populations are unavailable or imprecise, especially in the Arctic and Okhotsk subspecies, and there is little basis for quantitatively linking projected environmental conditions or other factors to ringed seal survival or reproduction. Our risk assessment therefore primarily evaluated important habitat features and was based upon the best available scientific and commercial data and the expert opinion of the BRT members.

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

The main concern about the conservation status of ringed seals stems from the likelihood that their 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 second concern, related by the common driver of carbon dioxide ($CO_2$) emissions, is the modification of habitat by ocean acidification, which may alter prey populations and other important aspects of the marine ecosystem. A reliable assessment of the future conservation status of each of the subspecies of the ringed seal therefore requires a focus on the observed and projected changes in sea ice, snow cover, ocean temperature, ocean pH (acidity), and associated changes in ringed seal prey species.

The threats associated with impacts of the warming climate on the habitat of ringed seals (analyzed in the preamble to the proposed rule and in the status review report), to the extent that they may pose risks to these seals, are expected to manifest throughout the current breeding and molting range (for snow and ice related threats) or throughout the entire range (for ocean warming and acidification) of each of the subspecies.

While our inferences about future regional ice and snow conditions are based upon the best available scientific and commercial data, we recognize that there are uncertainties associated with predictions based on hemispheric projections or indirect means. We also note that judging the timing of the onset of potential impacts to ringed seals is complicated by the coarse resolution of the IPCC models. Nevertheless, NMFS determined that the models reflect reasonable assumptions regarding habitat alterations to be faced by ringed seals in the foreseeable future.

Regional Sea Ice and Snow Cover Predictions by Subspecies

*Arctic ringed seal:* In the East Siberian, Chukchi, Beaufort, Kara-Laptev, and Greenland Seas, as well as in Baffin Bay and the Canadian Arctic Archipelago, little or no decline in ice extent is expected in April and May during the remainder of this century. In most of these areas, a moderate decline in sea ice is predicted during June within this century; while substantial declines in sea ice are projected in July and November after mid-century. The central Arctic (defined as regions north of 80° N. latitude) also shows declines in sea ice cover that are most apparent in July and November after 2050. For Hudson Bay, under a warmer climate scenario (for the years 2041–2070) Joly *et al.* (2010) projected a reduction in the sea ice season of 7–9 weeks, with substantial reductions in sea ice cover most apparent in July and during the first months of winter.

In the Bering Sea, April and May ice cover is projected to decline throughout this century, with substantial inter-annual variability forecasted in the eastern Bering Sea. The projection for May indicates that there will commonly be years with little or no ice in the western Bering Sea beyond mid-century. Very little ice has remained in the eastern Bering Sea in June since the mid-1970s. Sea ice cover in the Barents Sea in April and May is also projected to decline throughout this century, and in the months of June and July, ice is expected to disappear rapidly in the coming decades.

Based on model projections, April snow depths over much of the range of the Arctic ringed seal averaged 25–35 cm in the first decade of this century, consistent with on-ice measurements by Russian scientists (Weeks, 2010). By mid-century, a substantial decrease in areas with April snow depths of 25–35 cm is projected (much of it reduced to 20–25 cm). The deepest snow (25–30 cm) is forecasted to be found just north of Greenland, in the Canadian Arctic Archipelago, and in an area tapering north from there into the central Arctic Basin. Southerly regions, such as the Bering Sea and Barents Sea, are forecasted to have snow depths of 5 cm or less by mid-century. By the end of the century, April snow depths of 20–25 cm are forecasted only for a portion of the central Arctic, most of the Canadian Arctic Archipelago, and a few small isolated areas in a few other regions. Areas with 25–30 cm of snow are projected to be limited to a few small isolated pockets in the Canadian Arctic by 2090–2099.

*Okhotsk ringed seal:* None of the IPCC models performed satisfactorily at projecting sea ice for the Sea of Okhotsk, so projected surface air temperatures were examined relative to current climate conditions as a proxy to predict sea ice extent and duration. Sea ice extent is strongly controlled by temperature; this is especially true for smaller bodies of water relative to the grid size of available models. Also, the physical processes by which increased greenhouse gases (GHGs) lead to warming are better understood and more easily modeled than the other processes that influence sea ice

formation and persistence. Therefore, whether the whole geographic region around the Sea of Okhotsk is above or below the freezing point of sea water should be a reasonable indicator of the presence or absence of sea ice.

Based on that analysis, ice is expected to persist in the Sea of Okhotsk in March during the remainder of this century, although ice may be limited to the northern region in most years after mid-century. Conditions for sea ice in April are likely to be limited to the far northern reaches of the Sea of Okhotsk or non-existent by 2100. Little to no sea ice is expected in May by mid-century. Average snow depth projections for April show depths of 15–20 cm only in the northern portions of the Sea of Okhotsk in the past 10 years and nowhere in that sea by mid-century. By the end of the century average snow depths are projected to be 10 cm or less even in the northern Sea of Okhotsk.

*Baltic and Ladoga ringed seals:* For the Baltic Sea, we considered the analysis of regional climate models by Jylhä *et al.* (2008). They used seven regional climate models and found good agreement with observations for the 1902–2000 comparison period. For the forecast period 2071–2100, one model predicted a change to mostly mild conditions, while the remaining models predicted unprecedentedly mild conditions. They noted that their estimates for a warming climate were in agreement with other studies that found unprecedentedly mild ice extent conditions in the majority of years after about 2030. The model we used to project snow depths (CCSM3) did not provide adequate resolution for the Baltic Sea. The climate models analyzed by Jylhä *et al.* (2008), however, forecasted decreases of 45–60 days in duration of snow cover by the end of the century in the northern Baltic Sea region. The shortened seasonal snow cover would result primarily from earlier spring melts, but also from delayed onset of snow cover. Depth of snow is forecasted to decrease 50–70 percent in the region over the same period. The depth of snow also will be decreased by mid-winter thaws and rain events. Simulations of the snow cover indicated that an increasing proportion of the snow pack will consist of icy or wet snow.

For example, ice cover has diminished about 12 percent over the past 50 years in Lake Ladoga. Although we are not aware of any ice forecasts specific to Lake Ladoga, the simulations of future climate reported by Jylhä *et al.* (2008) suggest warming winters with reduced ice and snow cover. Snow cover in Finland and the Scandinavian Peninsula is projected to decrease 10–30 percent before mid-century and 50–90 percent by 2100 (Saelthun *et al.,* 1998, *cited in* Kuusisto, 2005).

Effects of Changes in Ice and Snow Cover on Ringed Seals

Ringed seals are vulnerable to habitat loss from changes in the extent or concentration of sea ice because they depend on this habitat for pupping, nursing, molting, and resting. The ringed seal's broad distribution, ability to undertake long movements, diverse diet, and association with widely varying ice conditions suggest resilience in the face of environmental variability. However, the ringed seal's long generation time and ability to produce only a single pup each year will challenge its ability to adapt to environmental changes such as the diminishing ice and snow cover projected in a matter of decades. Ringed seals apparently thrived during glacial maxima and survived warm interglacial periods. How they survived the latter periods or in what numbers is not known. Declines in sea ice cover in recent decades are more extensive and rapid than any other known decline for at least the last few thousand years (Polyak *et al.,* 2010).

Ringed seals create birth lairs in areas of accumulated snow on stable ice including the shorefast ice over continental shelves along Arctic coasts, bays, and inter-island channels. While some authors suggest that shorefast ice (ice attached to the shore) is the preferred pupping habitat of ringed seals due to its stability throughout the pupping and nursing period, others have documented ringed seal pupping on drifting pack ice both nearshore and offshore. Both of these habitats can be affected by earlier warming and break-up in the spring, which shortens the length of time pups have to grow and mature in a protected setting. Harwood *et al.* (2000) reported that an early spring break-up negatively impacted the growth, condition, and apparent survival of unweaned ringed seal pups. Early break-up was believed to have interrupted lactation in adult females, which in turn, negatively affected the condition and growth of pups.

Unusually heavy ice has also been implicated in shifting distribution, high winter mortality, and reduced productivity of ringed seals. It has been suggested that reduced ice thickness associated with warming in some areas could lead to increased biological productivity that might benefit ringed seals, at least in the short-term. However, any transitory and localized benefits of reduced ice thickness are expected to be outweighed by the negative effects of increased thermoregulatory costs and vulnerability of seal pups to predation associated with earlier ice break-up and reduced snow cover.

Ringed seals, especially the newborn, depend on snow cover for protection from cold temperatures and predators. Occupation of subnivean lairs is especially critical when pups are nursed in late March–June. Ferguson *et al.* (2005) attributed low ringed seal recruitment in western Hudson Bay to decreased snow depth in April and May. Reduced snowfall results in less snow drift accumulation next to pressure ridges, and pups in lairs with thin snow cover are more vulnerable to predation than pups in lairs with thick snow cover (Hammill and Smith, 1989; Ferguson *et al.,* 2005). When snow cover is insufficient, pups can also freeze in their lairs as documented in 1974 when roofs of lairs in the White Sea were only 5–10 cm thick (Lukin and Potelov, 1978). Similarly, pup mortality from freezing and polar bear (*Ursus maritimus*) predation increased when unusually warm spring temperatures caused early melting near Baffin Island in the late 1970s (Smith and Hammill, 1980; Stirling and Smith, 2004). Prematurely exposed pups also are vulnerable to predation by wolves (*Canis lupus*) and foxes (*Alopex lagopus* and *Vulpes vulpes)*—as documented during an early snow melt in the White Sea in 1977 (Lukin, 1980)—and by gulls (Laridae) and ravens (*Corvus corax*) as documented in the Barents Sea (Gjertz and Lydersen, 1983; Lydersen and Gjertz, 1987; Lydersen *et al.,* 1987; Lydersen and Smith, 1989; Lydersen and Ryg, 1990; Lydersen, 1998). When lack of snow cover has forced birthing to occur in the open, some studies have reported that nearly 100 percent of pups died from predation (Kumlien, 1879; Lydersen *et al.,* 1987; Lydersen and Smith, 1989; Smith *et al.,* 1991; Smith and Lydersen, 1991). The high fidelity to birthing sites exhibited by ringed seals also makes them more susceptible to localized degradation of snow cover (Kelly *et al.,* 2010b).

Increased rain-on-snow events during the late winter also negatively affect ringed seal recruitment by damaging or eliminating snow-covered birth lairs, increasing exposure and the risk of hypothermia, and facilitating predation by polar bears and other predators. Stirling and Smith (2004) documented the collapse of subnivean lairs during unseasonal rains near southeastern Baffin Island and the subsequent exposure of ringed seals to hypothermia.

They surmised that most of the pups that survived exposure to cold were eventually killed by polar bears, Arctic foxes, or possibly gulls. Stirling and Smith (2004) postulated that, should early season rain become regular and widespread in the future, mortality of ringed seal pups will increase, especially in more southerly parts of their range.

Potential Impacts of Projected Ice and Snow Cover Changes on Ringed Seals

As discussed above, ringed seals divide their time between foraging in the water, and reproducing and molting out of the water, where they are especially vulnerable to predation. Females must nurse their pups for 1–2 months, and the small pups are vulnerable to cold temperatures and avian and mammalian predators on the ice, especially during the nursing period. Thus, a specific habitat requirement for ringed seals is adequate snow for the occupation of subnivean lairs, especially in spring when pups are born and nursed.

Northern Hemisphere snow cover has declined in recent decades and spring melt times have become earlier (ACIA, 2005). In most areas of the Arctic Ocean, snow melt advanced 1–6 weeks from 1979–2007. Throughout most of the ringed seal's range, snow melt occurred within a couple of weeks of weaning. Thus, in the past three decades, snow melts in many areas have been pre-dating weaning. Shifts in the timing of reproduction by other pinnipeds in response to changes in food availability have been documented. However, the ability of ringed seals to adapt to earlier snow melts by advancing the timing of reproduction will be limited by snow depths. As discussed above, over most of the Arctic Ocean, snow cover reaches its maximal depth in May, but most of that accumulation takes place in autumn. It is therefore unlikely that snow depths for birth lair formation would be improved earlier in the spring. In addition, the pace at which snow melts are advancing is rapid relative to the generation time of ringed seals, further challenging the potential for an adaptive response.

Snow drifts to 45 cm or more are needed for excavation and maintenance of simple lairs, and birth lairs require depths of 50 to 65 cm or more (Smith and Stirling, 1975; Lydersen and Gjertz, 1986; Kelly, 1988; Furgal *et al.,* 1996; Lydersen, 1998; Lukin *et al.,* 2006). Such drifts typically only occur where average snow depths are at least 20–30 cm (on flat ice) and where drifting has taken place along pressure ridges or ice hummocks (Hammill and Smith, 1991; Lydersen and Ryg, 1991; Smith and Lydersen, 1991; Ferguson *et al.,* 2005). We therefore considered areas forecasted to have less than 20 cm average snow depth in April to be inadequate for the formation of ringed seal birth lairs.

*Arctic ringed seal:* The depth and duration of snow cover is projected to decrease throughout the range of Arctic ringed seals within this century. Whether ringed seals will continue to move north with retreating ice over the deeper, less productive Arctic Basin waters and whether forage species that they prey on will also move north is uncertain and speculative (see additional discussion below). Initially, it is possible that impacts will be somewhat ameliorated if the subspecies' range retracts northward with its sea ice habitats. By 2100, however, April snow cover is forecasted to become inadequate for the formation and occupation of ringed seal birth lairs over much of the subspecies' range. Thus, even if the range of the Arctic ringed seal contracts northward, by 2100 April snow cover suitable for birth lairs is expected to be limited to a portion of the central Arctic, most of the Canadian Arctic Archipelago, and a few other small isolated areas. The projected decreases in ice and, especially, snow cover are expected to lead to increased pup mortality from premature weaning, hypothermia, and predation.

*Okhotsk ringed seal:* Based on temperature proxies (which were used because the climate models did not meet the performance criteria for projecting sea ice), ice is expected to persist in the Sea of Okhotsk through the onset of pupping in March through the end of this century. Ice suitable for pupping and nursing likely will be limited to the northernmost portions of the sea, as ice is likely to be limited to that region in April by the end of the century. The snow cover projections suggest that snow depths may already be inadequate for lairs in the Sea of Okhotsk, and most Okhotsk ringed seals apparently now give birth on pack ice in the lee of ice hummocks. However, it appears unlikely that this behavior could mitigate the threats posed by the expected decreases in sea ice. The Sea of Okhotsk is bounded to the north by land, which will limit the ability of Okhotsk ringed seals to respond to deteriorating sea ice and snow conditions by shifting their range northward. Some Okhotsk ringed seals have been reported on terrestrial resting sites during the ice-free season, but these sites provide inferior pupping and nursing habitat. Within the foreseeable future, the projected decreases in sea ice habitat suitable for pupping, nursing, and molting in the Sea of Okhotsk are expected to lead to reduced abundance and productivity.

*Baltic and Ladoga ringed seals:* The considerable reductions in ice extent forecasted by mid-century, coupled with deteriorating snow conditions, are expected to substantially alter the habitats of Baltic ringed seals. Climate forecasts for northern Europe also suggest reduced ice and snow cover for Lake Ladoga within this century. These habitat changes are expected to lead to decreased survival of pups (due to hypothermia, predation, and premature weaning) and considerable declines in the abundance of these subspecies in the foreseeable future. Although Baltic and Ladoga ringed seals have been reported using terrestrial resting sites when ice is absent, these sites provide inferior pupping and nursing habitat. As sea ice and snow conditions deteriorate, Baltic ringed seals will be limited in their ability to respond by shifting their range northward because the Baltic Sea is bounded to the north by land; and the landlocked seal population in Lake Ladoga will be unable to shift its range.

Impacts on Ringed Seals Related to Changes in Ocean Conditions

Ocean acidification is an ongoing process whereby chemical reactions occur that reduce both seawater pH and the concentration of carbonate ions when $CO_2$ is absorbed by seawater. Results from global ocean $CO_2$ surveys over the past two decades have shown that ocean acidification is a predictable consequence of rising atmospheric $CO_2$ levels. The process of ocean acidification has long been recognized, but the ecological implications of such chemical changes have only recently begun to be appreciated. The waters of the Arctic and adjacent seas are among the most vulnerable to ocean acidification. Seawater chemistry measurements in the Baltic Sea suggest that this sea is equally vulnerable to acidification as the Arctic. We are not aware of specific acidification studies in Lake Ladoga. Fresh water systems, however, are much less buffered than ocean waters and are likely to experience even larger changes in acidification levels than marine systems. The most likely impact of ocean acidification on ringed seals will be at lower tropic levels on which the species' prey depends. Cascading effects are likely both in the marine and freshwater environments. Our limited understanding of planktonic and benthic calcifiers in the Arctic (*e.g.,* even their baseline geographical

distributions) means that future changes will be difficult to detect and evaluate.

Warming water temperatures and decreasing ice likely will result in a contraction in the range of Arctic cod, a primary prey of ringed seals. The same changes will lead to colonization of the Arctic Ocean by more southerly species, including potential prey, predators, and competitors. The outcome of new competitive interactions cannot be specified, but as sea-ice specialists, ringed seals may be at a disadvantage in competition with generalists in an ice-diminished Arctic. Prey biomass may be reduced as a consequence of increased freshwater input and loss of sea ice habitat for amphipods and copepods. On the other hand, overall pelagic productivity may increase.

Summary of Factor A Analysis

Climate models consistently project overall diminishing sea ice and snow cover at least through the current century, with regional variation in the timing and severity of those losses. Increasing atmospheric concentrations of greenhouse gases, including $CO_2$, will drive climate warming and increase acidification of the ringed seal's ocean and lake habitats. The impact of ocean warming and acidification on ringed seals is expected to be primarily through changes in community composition. The precise extent and timing of these changes is uncertain, yet the overall trend is clear: Ringed seals will face an increasing degree of habitat modification through the foreseeable future.

Diminishing ice and snow cover are the greatest challenges to persistence of all of the ringed seal subspecies. While winter precipitation is forecasted to increase in a warming Arctic, the duration of ice cover is projected to be substantially reduced, and the net effect will be lower snow accumulation on the ice. Within the century, snow cover adequate for the formation and occupation of birth lairs is forecasted to occur in only parts of the Canadian Arctic Archipelago, a portion of the central Arctic, and a few small isolated areas in other regions. Without the protection of lairs, ringed seals, especially newborns, are vulnerable to freezing and predation. We conclude that the ongoing and projected changes in sea ice habitat pose significant threats to the persistence of each of the five subspecies of the ringed seal and are likely to curtail the range of the species substantially within the foreseeable future.

*B. Overutilization for Commercial, Subsistence, Recreational, Scientific, or Educational Purposes*

Ringed seals have been hunted by humans for millennia and remain a fundamental subsistence resource for many northern coastal communities today. Ringed seals were also harvested commercially in large numbers during the 20th century, which led to the depletion of their stocks in many parts of their range. Commercial harvests in the Sea of Okhotsk and predator-control harvests in the Baltic Sea and Lake Ladoga caused population declines in the past, but have since been restricted. Although subsistence harvest of the Arctic subspecies is currently substantial in some regions, harvest levels presently seem sustainable. Climate change is likely to alter patterns of subsistence harvest of marine mammals by changing their local densities or distributions in relation to hunting communities. Predictions of the impacts of climate change on subsistence hunting pressure are constrained by the complexity of interacting variables and imprecision of climate and sea ice models at small scales. Accurate information on both harvest levels and species' abundance and trends will be needed in order to assess the future impacts of hunting as well as to respond appropriately to potential climate-induced changes in populations. Recreational, scientific, and educational uses of ringed seals are minimal and are not expected to increase significantly in the foreseeable future. We conclude that there is no evidence that overutilization of ringed seals is occurring at present.

*C. Diseases, Parasites, and Predation*

Ringed seals have co-evolved with numerous parasites and diseases, and those relationships are presumed to be stable. Evidence of distemper virus, for example, has been reported in Arctic ringed seals, but there is no evidence of population-level impacts to ringed seal abundance or productivity. After the proposed listing rule was published, the occurrence of an elevated number of sick or dead ringed seals in the Arctic and Bering Strait regions of Alaska beginning in July 2011 led to the declaration of an unusual mortality event (UME) by NMFS under the Marine Mammal Protection Act (MMPA) on December 20, 2011. The underlying cause of this UME is unknown and remains under focused expert investigation. Abiotic and biotic changes to ringed seal habitat potentially could lead to exposure to new pathogens or new levels of virulence, but we continue to consider the potential threats to ringed seals from disease as low.

Ringed seals are most commonly preyed upon by Arctic foxes and polar bears, and less commonly by other terrestrial carnivores, sharks, and killer whales (*Orcinus orca*). When ringed seal pups are forced out of subnivean lairs prematurely because of low snow accumulation and/or early melts, gulls and ravens also successfully prey on them. Avian predation is facilitated not only by lack of sufficient snow cover but also by conditions favoring influxes of birds. Lydersen and Smith (1989) pointed out that the small size of newborn ringed seals, coupled with their prolonged nursing period, make them vulnerable to predation by birds and likely set a southern limit to their distribution.

Ringed seals and bearded seals are the primary prey of polar bears. Polar bear predation on ringed seals is most successful in moving offshore ice, often along floe edges and rarely in ice-free waters. Polar bears also successfully hunt ringed seals on stable shorefast ice by catching animals when they surface to breathe and when they occupy lairs. Hammill and Smith (1991) further noted that polar bear predation on ringed seal pups increased 4-fold in a year when average snow depths in their study area decreased from 23 to 10 cm. They concluded that while a high proportion of pups born each year are lost to predation, ''without the protection provided by the subnivean lair, pup mortality would be much higher.''

The distribution of Arctic foxes broadly overlaps with that of Arctic ringed seals. Arctic foxes prey on newborn seals by tunneling into the birth lairs. The range of the red fox overlaps with that of the Okhotsk, Baltic, and Ladoga subspecies, and on rare occasion red foxes also prey on newborn ringed seals in lairs.

High rates of predation on ringed seal pups have been associated with anomalous weather events that caused subnivean lairs to collapse or melt before pups were weaned. Thus, declining snow depths and duration of snow cover during the period when ringed seal pups are born and nursed can be expected to lead to increased predation on ringed seal pups. We conclude that the threat posed to ringed seals by predation is currently moderate, but predation risk is expected to increase as snow and sea ice conditions change with a warming climate.

*D. Inadequacy of Existing Regulatory Mechanisms*

As noted above in the discussion of Factor A, a primary concern about the conservation status of the ringed seal stems 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 combined with modification of habitat by ocean acidification. Current mechanisms do not effectively regulate GHG emissions, which are contributing to global climate change and associated modifications to ringed seal habitat. The projections we used to assess risks from GHG emissions were based on the assumption that no new regulation will take place (the underlying IPCC emissions scenarios were all ''non-mitigated'' scenarios). Therefore, the inadequacy of mechanisms to regulate GHG emissions is already included in our risk assessment, and contributes to the risks posed to ringed seals by these emissions.

Based on questionnaire and interview data obtained from fishermen at Lake Ladoga, Verevkin *et al.* (2006, 2010) concluded that annual bycatch mortality of Ladoga ringed seals has been substantial in recent years and that mitigation measures are needed. Thus inadequacy of existing mechanisms to regulate bycatch of Ladoga ringed seals is contributing to the severity of the threat posed by fisheries interactions with that subspecies, and compounds the effects of threats induced by climate change discussed above.

*E. Other Natural or Manmade Factors Affecting the Species' Continued Existence*

Pollution and Contaminants

Contaminants research on ringed seals is extensive and has been conducted in most parts of the species' range (with the exception of the Sea of Okhotsk), particularly throughout the Arctic environment where ringed seals are an important diet item in coastal human communities. Pollutants such as organochlorine (OC) compounds and heavy metals have been found in all of the subspecies of ringed seal (with the exception of the Okhotsk ringed seal). The variety, sources, and transport mechanisms of contaminants vary across ringed seal ecosystems. Statistical analysis of OC compounds in marine mammals has shown that, for most OCs, the European Arctic is more contaminated than the Canadian and U.S. Arctic.

Reduced productivity in the Baltic ringed seal in recent decades resulted from impaired fertility that was associated with pollutants. High levels of DDT (dichloro-diphenyl-trichloroethane) and PCBs (polychlorinated biphenyls) were found in Baltic (Bothnian Bay) ringed seals in the 1960s and 1970s, and PCB levels were correlated with reproductive failure. More recently, PFOSs (perfluorooctane sulfonate; a perfluorinated contaminant or PFC) were reported as 15 times greater in Baltic ringed seals than in Arctic ringed seals.

Present and future impacts of contaminants on ringed seal populations warrant further study. Climate change has the potential to increase the transport of pollutants from lower latitudes to the Arctic, highlighting the importance of continued monitoring of ringed seal contaminant levels. The BRT considered the potential threat posed to ringed seals from contaminants as of low to moderate significance, with the least threat identified for Arctic ringed seals and the greatest for Baltic ringed seals.

Oil and Gas Activities

Extensive oil and gas reserves coupled with rising global demand make it very likely that oil and gas development activity will increase throughout the U.S. Arctic and internationally in the future. Climate change is expected to enhance marine access to offshore oil and gas reserves by reducing sea ice extent, thickness, and seasonal duration, thereby improving ship access to these resources around the margins of the Arctic Basin. Oil and gas exploration, development, and production activities include, but are not limited to: Seismic surveys; exploratory, delineation, and production drilling operations; construction of artificial islands, causeways, ice roads, shore-based facilities, and pipelines; and vessel and aircraft operations. These activities have the potential to affect ringed seals primarily through noise, physical disturbance, and pollution, particularly in the event of a large oil spill or blowout.

Within the range of the Arctic ringed seal, offshore oil and gas exploration and production activities are currently underway in the United States, Canada, Greenland, Norway, and Russia. In the United States, oil and gas activities have been conducted off the coast of Alaska since the 1970s, with most of the activity occurring in the Beaufort Sea. Although five exploratory wells have previously been drilled in the Chukchi Sea, no oil fields have been developed or brought into production. Shell plans to drill up to three wells during 2012 at several locations in the northeast Chukchi Sea. Shell also plans to drill offshore in the Beaufort Sea in 2012 near Camden Bay. No offshore oil or gas fields are currently in development or production in the Bering Sea.

About 80 percent of the oil and 99 percent of the gas produced in the Arctic comes from Russia (AMAP, 2007). With over 75 percent of known Arctic oil, over 90 percent of known Arctic gas, and vast estimates of undiscovered oil and gas reserves, Russia will likely continue to be the dominant producer of Arctic oil and gas in the future (AMAP, 2007). Oil and gas developments in the Kara and Barents Seas began in 1992, and large-scale production activities were initiated during 1998–2000. Oil and gas production activities are expected to grow in the western Siberian provinces and Kara and Barents Seas in the future. Recently there has also been renewed interest in the Russian Chukchi Sea, as new evidence emerges to support the notion that the region may contain world-class oil and gas reserves. In the Sea of Okhotsk, oil and natural gas operations are active off the northeastern coast of Sakhalin Island, and future developments are planned in the western Kamchatka and Magadan regions.

A major project underway in the Baltic Sea is the Nord Stream 1,200-km gas line, which will be the longest subsea natural gas pipeline in the world. Concerns have been expressed about the potential disturbance of World War II landmines and chemical toxins in the sediment during construction. There are also concerns about potential leaks and spills from the pipeline and impacts on the Baltic Sea marine environment once the pipeline is operational. Circulation of waters in the Baltic Sea is limited and any contaminants may not be flushed efficiently.

Large oil spills or blowouts are considered to be the greatest threat of oil and gas exploration activities in the marine environment. In contrast to spills on land, large spills at sea are difficult to contain and may spread over hundreds or thousands of kilometers. Responding to a spill in the Arctic environment would be particularly challenging. The U.S. Arctic has very little infrastructure to support oil spill response, with few roads and no major port facilities. Reaching a spill site and responding effectively would be especially difficult, if not impossible, in winter when weather can be severe and daylight extremely limited. Oil spills under ice would be the most

challenging because industry and government have little experience containing or effectively recovering spilled oil in such conditions. The difficulties experienced in stopping and containing the blowout at the Deepwater Horizon well in the Gulf of Mexico, where environmental conditions and response preparedness are comparatively good (but waters are much deeper than the Arctic continental shelf), point toward even greater challenges of attempting a similar feat in a much more environmentally severe and geographically remote location.

Although planning, management, and use of best practices can help reduce risks and impacts, the history of oil and gas activities indicates that accidents cannot be eliminated. Tanker spills, pipeline leaks, and oil blowouts are likely to occur in the future, even under the most stringent regulatory and safety systems. In the Sea of Okhotsk, an accident at an oil production complex resulted in a large (3.5-ton) spill in 1999, and in winter 2009, an unknown quantity of oil associated with a tanker fouled 3 km of coastline and hundreds of birds in Aniva Bay (Sakhalin Island). In the Arctic, a blowout at an offshore platform in the Ekofisk oil field in the North Sea in 1977 released more than 200,000 barrels of oil.

Researchers have suggested that pups of ice-associated seals may be particularly vulnerable to fouling of their dense lanugo coats. Adults, juveniles, and weaned young of the year rely on blubber for insulation, so effects of oiling on their thermoregulation are expected to be minimal. A variety of other acute effects of oil exposure have been shown to reduce seals' health and possibly survival. Direct ingestion of oil, ingestion of contaminated prey, or inhalation of hydrocarbon vapors can cause serious health effects including death.

The BRT considered the threat posed to ringed seals by disturbance, injury, or mortality from oil spills, and/or other discharges, as of low to moderate significance, with the greatest threat identified for Okhotsk and Baltic ringed seals.

Commercial Fisheries Interactions and Bycatch

Commercial fisheries may affect ringed seals through direct interactions (*i.e.,* incidental take or bycatch) and indirectly through competition for prey resources and other impacts on prey populations. NMFS has access to estimates of Arctic ringed seal bycatch only for commercial fisheries that operate in Alaska waters. Based on data from 2002–2006, there has been an annual average of 0.46 Arctic ringed seal mortalities incidental to commercial fishing operations. NAMMCO (2002) stated that in the North Atlantic region Arctic ringed seals are seldom caught in fishing gear because their distribution does not coincide with intensive fisheries in most areas. We could find no information regarding ringed seal bycatch levels in the Sea of Okhotsk; however, given the intensive levels of commercial fishing that occur in this sea, bycatch of ringed seals likely occurs there. The BRT considered the threat posed to Okhotsk ringed seals from physical disturbance associated with the combined factors of oil and gas development, shipping, and commercial fisheries moderately significant.

Drowning in fishing gear has been reported as one of the most significant mortality factors for seals in the Baltic Sea, especially for young seals. There are no reliable estimates of seal bycatch in this sea, and existing estimates are known to be low in many areas, making risk assessment difficult. Based on monitoring of 5 percent of the commercial fishing effort in the Swedish coastal fisheries, bycatch of Baltic ringed seals was estimated at 50 seals in 2004. In Finland, it was estimated that about 70 Baltic ringed seals were caught by fishing gear annually during the period 1997–1999. There are no estimates of seal bycatch from Lithuanian, Estonian, or Russian waters of the Baltic. It has been suggested that decreases in the use of the most harmful types of nets (*i.e.,* gillnets and unprotected trap nets), along with the development of seal-proof fishing gear, may have resulted in a decline in Baltic ringed seal bycatch (Ministry of Agriculture and Forestry, 2007).

It has been estimated that 200–400 Ladoga ringed seals died annually in fishing gear during the late 1980s and early 1990s. Fishing patterns reportedly changed since then, and in the late 1990s fishing was not regarded to be a threat to Ladoga ringed seal populations, although it was suggested that it could become so should market conditions improve (Sipilä and Hyvärinen, 1998). Based on interviews with fishermen in Lake Ladoga, Verevkin *et al.* (2006) reported that at least 483 Ladoga ringed seals were killed in fishing gear in 2003, even though official records only recorded 60 cases of bycatch. Further, Verevkin *et al.* (2010) reported questionnaire responses by fishermen that indicated annual bycatch of Ladoga ringed seals caught in fishing nets has been substantial in recent years.

For indirect interactions, we note that commercial fisheries target a number of known ringed seal prey species such as walleye pollock (*Theragra chalcogramma*), Pacific cod, herring (*Clupea* sp.), and capelin. These fisheries may affect ringed seals indirectly through reductions in prey biomass and through other fishing mediated changes in ringed seal prey species.

Shipping

The reduction in Arctic sea ice that has occurred in recent years has renewed interest in using the Arctic Ocean as a potential waterway for coastal, regional, and trans-Arctic marine operations. Climate models predict that the warming trend in the Arctic will accelerate, causing the ice to begin melting earlier in the spring and resume freezing later in the fall, resulting in an expansion of potential shipping routes and lengthening the potential navigation season.

The most significant risk posed by shipping activities in the Arctic is the accidental or illegal discharge of oil or other toxic substances carried by ships, due to their immediate and potentially long-term effects on individual animals, populations, food webs, and the environment. Shipping activities can also affect ringed seals directly through noise and physical disturbance (*e.g.,* icebreaking vessels), as well as indirectly through ship emissions and the possibility of introducing exotic species that may affect ringed seal food webs.

Current and future shipping activities in the Arctic pose varying levels of threats to ringed seals depending on the type and intensity of the shipping activity and its degree of spatial and temporal overlap with ringed seal habitats. These factors are inherently difficult to predict, making threat assessment highly uncertain. However, given what is currently known about ringed seal populations and shipping activity in the Arctic, some general assessments can be made. Arctic ringed seal densities are variable and depend on many factors; however, they are often reported to be widely distributed in relatively low densities and rarely congregate in large numbers. This may help mitigate the risks of more localized shipping threats (*e.g.,* oil spills or physical disturbance), since the impacts from such events would be less likely to affect large numbers of seals. The fact that nearly all shipping activity in the Arctic (with the exception of icebreaking) purposefully avoids areas of ice and primarily occurs during the ice-free or low-ice seasons also helps to

mitigate the risks associated with shipping to ringed seals, since they are closely associated with ice at nearly all times of the year. Icebreakers pose special risks to ringed seals because they are capable of operating year-round in all but the heaviest ice conditions and are often used to escort other types of vessels (*e.g.,* tankers and bulk carriers) through ice-covered areas. If icebreaking activities increase in the Arctic in the future as expected, the likelihood of negative impacts (*e.g.,* oil spills, pollution, noise, disturbance, and habitat alteration) occurring in ice-covered areas where ringed seals occur will likely also increase.

Though few details are available regarding shipping levels in the Sea of Okhotsk, resource development over the last decade stands out as a likely significant contributor. Relatively high levels of shipping are needed to support present oil and gas operations. In addition, large-scale commercial fishing occurs in many parts of the sea. Winter shipping activities in the southern Sea of Okhotsk are expected to increase considerably as oil and gas production pushes the development and use of new classes of icebreaking ships, thereby increasing the potential for shipping accidents and oil spills in the ice-covered regions of this sea.

The Baltic Sea is one of the most heavily trafficked shipping areas in the world, with more than 2,000 large ships (including about 200 oil tankers) sailing on its waters on an average day. Additionally, ferry lines, fishing boats, and cruise ships frequent the Baltic Sea. Both the number and size of ships (especially oil tankers) have grown in recent years, and the amount of oil transported in the Baltic (especially from the Gulf of Finland) has increased significantly since 2000. The risk of oil exposure for seals living in the Baltic Sea is considered to be greatest in the Gulf of Finland, where oil shipping routes pass through ringed seal pupping areas as well as close to rocks and islets where seals sometimes haul out. Icebreaking during the winter is considered to be the most significant marine traffic factor for seals in the Baltic Sea, especially in the Bothnian Bay.

Lake Ladoga is connected to the Baltic Sea and other bodies of water via a network of rivers and canals that are used as waterways to transport people, resources, and cargo throughout the Baltic region. However, reviews of the biology and conservation of Ladoga ringed seals have not identified shipping-related activities (other than accidental bycatch in fishing gear) as being important risks to the conservation status of this subspecies.

The threats posed from shipping activity in the Sea of Okhotsk, Baltic Sea, and Lake Ladoga and are largely the same as they are for the Arctic. Two obvious but important distinctions between these regions and the Arctic are that these bodies of water are geographically smaller and more confined than many areas where the Arctic subspecies lives, and they contain much smaller populations of ringed seals. Therefore, shipping and ringed seals are more likely to overlap spatially in these regions, and a single accident (*e.g.,* a large oil spill) could potentially impact these smaller populations severely. However, the lack of specific information on threats and impacts (now and in the future) makes threat assessment in these regions uncertain. More information is needed to adequately assess the risks of shipping to ringed seals. The BRT considered the threat posed to Okhotsk, Baltic, and Ladoga ringed seals from physical disturbance associated with the combined factors of oil and gas development, shipping, and commercial fisheries moderately significant, while also noting that drowning of seals in fishing nets and disturbance from human activities are specific conservation concerns for Ladoga ringed seals.

Summary of Factor E

We find that the threats posed by pollutants, oil and gas activities, fisheries, and shipping do not individually or collectively place the Arctic or Okhotsk subspecies of ringed seals at risk of becoming endangered in the foreseeable future. We recognize, however, that the significance of these threats would likely increase for populations diminished by the effects of climate change or other threats.

Reduced productivity in the Baltic Sea ringed seal in recent decades resulted from impaired fertility that was associated with pollutants. We do not have any information to conclude that there are currently population-level effects on Baltic ringed seals from contaminant exposure. We find that the threats posed by pollutants, petroleum development, commercial fisheries, and increased ship traffic do not individually or collectively pose a significant risk to the persistence of the Baltic ringed seals. We recognize, however, that the significance of these threats would likely increase for populations diminished by the effects of climate change or other threats. We also note that, particularly given the elevated contaminant load in the Baltic Sea, continued efforts are necessary to ensure that population-level effects from contaminant exposure do not recur in Baltic ringed seals in the future.

Drowning of seals in fishing gear and disturbance by human activities are conservation concerns for ringed seals in Lake Ladoga and could exacerbate the effects of climate change on this seal population. Drowning in fishing gear is also one of the most significant sources of mortality for ringed seals in the Baltic Sea. Although we currently do not have any data to conclude that these threats are having population-level effects on Baltic ringed seals, reported bycatch mortality in Lake Ladoga appears to pose a significant threat to that subspecies, particularly when combined with the effects of climate change on ringed seal habitat.

**Analysis of Demographic Risks**

Threats to a species' long-term persistence are manifested demographically as risks to its abundance, productivity, spatial structure and connectivity, and genetic and ecological diversity. These demographic risks provide the most direct indices or proxies of extinction risk. A species at very low levels of abundance and with few populations will be less tolerant to environmental variation, catastrophic events, genetic processes, demographic stochasticity, ecological interactions, and other processes. A rate of productivity that is unstable or declining over a long period of time can indicate poor resiliency to future environmental change. A species that is not widely distributed across a variety of well-connected habitats is at increased risk of extinction due to environmental perturbations, including catastrophic events. A species that has lost locally-adapted genetic and ecological diversity may lack the raw resources necessary to exploit a wide array of environments and endure short- and long-term environmental changes.

The key factors limiting the viability of all five ringed seal subspecies are the forecasted reductions in ice extent and, in particular, depths and duration of snow cover on ice. Early snow melts already are evident in much of the species' range. Increasingly late ice formation in autumn is forecasted, contributing to expectations of substantial decreases in snow accumulation. The ringed seal's specific requirement for habitats with adequate spring snow cover is manifested in the pups' low tolerance for exposure to wet, cold conditions and their vulnerability to predation. Premature failure of the snow cover has caused high mortality due to freezing and predation. Climate

warming will result in increasingly early snow melts, exposing vulnerable ringed seal pups to predators and hypothermia.

The BRT considered the current risks to the persistence of Arctic, Okhotsk, Baltic, and Ladoga ringed seals as low to moderate, with the Ladoga ringed seal receiving the highest scores. Within the foreseeable future, the BRT judged the risks to Arctic ringed seal persistence to be moderate (diversity and abundance) to high (productivity and spatial structure). As noted above, the impacts to Arctic ringed seals may be somewhat ameliorated initially if the subspecies' range retracts northward with sea ice habitats, but by the end of the century snow depths are projected to be insufficient for lair formation and maintenance throughout much of the subspecies' range, including the potentially retracted northward one. The BRT also judged the risks to persistence of the Okhotsk and Baltic ringed seal in the foreseeable future to be moderate (diversity) to high (abundance, productivity, and spatial structure). Okhotsk and Baltic ringed seals will have limited opportunity to shift their range northward because the sea ice will retract toward land.

Risks to Ladoga ringed seal persistence within the foreseeable future were judged by the BRT to be moderate (diversity), or high to very high (abundance, productivity, and spatial structure). As noted above, Ladoga ringed seals are a landlocked population that will be unable to shift their range in response to the pronounced degradation of ice and snow habitats forecasted to occur.

**Conservation Efforts**

When considering the listing of a species, section 4(b)(1)(A) of the ESA requires NMFS to consider 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. In addition to identifying these efforts, under the ESA and our Policy on the Evaluation of Conservation Efforts (68 FR 15100; March 28, 2003), we must evaluate the certainty of implementing the conservation efforts and the certainty that the conservation efforts will be effective on the basis of whether the effort or plan establishes specific conservation objectives, identifies the necessary steps to reduce threats or factors for decline, includes quantifiable performance measures for monitoring compliance and effectiveness, incorporates the principles of adaptive management, and is likely to improve the species' viability at the time of the listing determination.

*International Conservation Efforts Specifically to Protect Ringed Seals*

*Baltic ringed seals:* (1) Some protected areas in Sweden, Finland, the Russian Federation, and Estonia include Baltic ringed seal habitat; (2) the Baltic ringed seal is included in the Red Book of the Russian Federation as ''Category 2'' (decreasing abundance), is classified as ''Endangered'' in the Red Data Book of Estonia, and is listed as ''Near Threatened'' on the Finnish and Swedish Red Lists; and (3) Helsinki Commission (HELCOM) recommendation 27–28/2 (2006) on conservation of seals in the Baltic Sea established a seal expert group to address and coordinate seal conservation and management across the Baltic Sea region. This expert group has made progress toward completing a set of related tasks identified in the HELCOM recommendation, including coordinating development of national management plans and developing monitoring programs. The national red lists and red data books noted above highlight the conservation status of listed species and can inform conservation planning and prioritization.

*Ladoga ringed seals:* (1) In May 2009, Ladoga Skerries National Park, which will encompass northern and northwest Lake Ladoga, was added to the Russian Federation's list of protected areas to be established; and (2) the Ladoga ringed seal is included in the Red Data Books of the Russian Federation, the Leningrad Region, and Karelia.

*International Agreements*

The International Union for the Conservation of Nature and Natural Resources (IUCN) Red List identifies and documents those species believed by its reviewers to be most in need of conservation attention if global extinction rates are to be reduced, and is widely recognized as the most comprehensive, apolitical global approach for evaluating the conservation status of plant and animal species. In order to produce Red Lists of threatened species worldwide, the IUCN Species Survival Commission draws on a network of scientists and partner organizations, which uses a standardized assessment process to determine species' risks of extinction. However, it should be noted that the IUCN Red List assessment criteria differ from the listing criteria provided by the ESA. The ringed seal is currently classified as a species of ''Least Concern'' on the IUCN Red List. The Red List assessment notes that, given the risks posed to the ringed seal by climate change, the conservation status of all ringed seal subspecies should be reassessed within a decade. The European Red List compiles assessments of the conservation status of European species according to IUCN red listing guidelines. The assessment for the ringed seal currently classifies the Ladoga ringed seal as ''Vulnerable.'' The Baltic ringed seal is classified as a species of ''Least Concern'' on the European Red List, with the caveats that population numbers remain low and that there are significant conservation concerns in some part of the Baltic Sea. Similar to inclusion in national red lists and red data books, these listings highlight the conservation status of listed species and can inform conservation planning and prioritization.

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) is a regional treaty on conservation. Current parties to the Bern Convention within the range of the ringed seal include Norway, Sweden, Finland, Estonia, and Latvia. The agreement calls for signatories to provide special protection for fauna species listed in Appendix II (species to be strictly protected) and Appendix III to the convention (species for which any exploitation is to be regulated). The Ladoga ringed seal is listed under Appendix II, and other ringed seals fall under Appendix III. Hunting of Ladoga ringed seals has been prohibited since 1980, and hunting of Baltic ringed seals has also been suspended (although Finland permitted the harvest of small numbers of ringed seals in the Bothnian Bay beginning in 2010).

The provisions of the Council of the European Union's Directive 92/43/EEC on the Conservation of Natural Habitats of Wild Fauna and Flora (Habitats Directive) are intended to promote the conservation of biodiversity in European Union (EU) member countries. EU members meet the habitat conservation requirements of the directive by designating qualified sites for inclusion in a special conservation areas network known as Natura 2000. Current members of the EU within the range of the ringed seal include Sweden, Finland, and Estonia. Annex II to the Habitats Directive lists species whose conservation is to be specifically considered in designating special

conservation areas, Annex IV identifies species determined to be in need of strict protection, and Annex V identifies species whose exploitation may require specific management measures to maintain favorable conservation status. The Baltic ringed seal is listed in Annex II and V, and the Arctic ringed seal is listed in Annex V. Some designated Natura 2000 sites include Baltic ringed seal habitat.

In 2005 the International Maritime Organization (IMO) designated the Baltic Sea Area outside of Russian territorial waters as a Particularly Sensitive Sea Area (PSSA), which provides a framework under IMO's International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) for developing internationally agreed upon measures to reduce risks posed from maritime shipping activities. To date, a maritime traffic separation scheme is the sole protective measure associated with the Baltic PSSA. Expansion of Russian oil terminals is contributing to a marked increase in oil transport in the Baltic Sea; however, the Russian Federation has declined to support the Baltic Sea PSSA designation.

HELCOM's main goal since the Helsinki convention first entered force in 1980 has been to address Baltic Sea pollution caused by hazardous substances and to restore and safeguard the ecology of the Baltic. HELCOM acts as a coordinating body among the nine countries with coasts along the Baltic Sea. Activities of HELCOM have led to significant reductions in a number of monitored hazardous substances in the Baltic Sea. However, pollution caused by hazardous substances continues to pose risks.

The Agreement on Cooperation in Research, Conservation, and Management of Marine Mammals in the North Atlantic (North Atlantic Marine Mammal Commission [NAMMCO]) was established in 1992 by a regional agreement among the governments of Greenland, Iceland, Norway, and the Faroe Islands to cooperatively conserve and manage marine mammals in the North Atlantic. NAMMCO has provided a forum for the exchange of information and coordination among member countries on ringed seal research and management.

*Domestic U.S. Conservation Efforts*

NMFS is not aware of any formalized conservation efforts for ringed 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. Therefore, we do not need to evaluate any domestic conservation efforts under our Policy on Evaluating Conservation Efforts (68 FR 15100; March 28, 2003).

NMFS has established a co-management agreement with the Ice Seal Committee (ISC) to conserve and provide co-management of subsistence use of ice seals by Alaska Natives. The ISC 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. NMFS's National Marine Mammal Laboratory is engaged in an active research program for ringed seals. The new information from this research will be used to enhance our understanding of the risk factors affecting ringed seals, thereby improving our ability to develop effective management measures for the species.

**Listing Determinations**

We have reviewed the status of the ringed seal, fully considering the best scientific and commercial data available, including the status review report. We have reviewed threats to these subspecies of the ringed seal, as well as other relevant factors, and considered conservation efforts and special designations for ringed seals by states and foreign nations. In consideration of all of the threats and potential threats to ringed seals 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:

*Arctic subspecies:* (1) There are no specific estimates of population size available for the Arctic subspecies, but most experts postulate that the population numbers in the millions. (2) The depth and duration of snow cover are forecasted to decrease substantially throughout the range of the Arctic ringed seal. Within this century, snow cover is forecasted to be inadequate for the formation and occupation of birth lairs over most of the subspecies' range. (3) Because ringed seals stay with the ice as it annually advances and retreats, the southern edge of the ringed seal's range may initially shift northward. Whether ringed seals will continue to move north with retreating ice over the deeper, less productive Arctic Basin waters and whether the species that they prey on will also move north is uncertain. (4) The Arctic ringed seal's pupping and nursing seasons are adapted to the phenology of ice and snow. The projected decreases in sea ice, snow cover, and thermal capacity of birthing lairs will likely lead to decreased pup survival. Thus, within the foreseeable future it is likely that the number of Arctic ringed seals will decline substantially, and they will no longer persist in substantial portions of their range. We have determined that the Arctic subspecies of the ringed seal is not in danger of extinction throughout all of its range, but is likely to become so within the foreseeable future. Therefore, we are listing it as threatened.

*Okhotsk subspecies:* (1) The best available scientific data suggest a conservative estimate of 676,000 ringed seals in the Sea of Okhotsk, apparently reduced from historical numbers. It has been estimated that the ringed seal population in the Sea of Okhotsk numbered more than one million in 1955. (2) Before the end of the current century, ice suitable for pupping and nursing is forecasted to be limited to the northernmost regions of the Sea of Okhotsk, and projections suggest that snow cover may already be inadequate for birth lairs. The Sea of Okhotsk is bounded to the north by land, which will limit the ability of Okhotsk ringed seals to respond to deteriorating sea ice and snow conditions by shifting their range northward. (3) Although some Okhotsk ringed seals have been reported resting on island shores during the ice-free season, we are not aware of any occurrence of ringed seals whelping or nursing young on land. (4) The Okhotsk ringed seal's pupping and nursing seasons are adapted to the phenology of ice and snow. Decreases in sea ice habitat suitable for pupping, nursing, and molting will likely lead to declines in abundance and productivity of the Okhotsk subspecies. We have determined that the Okhotsk subspecies of the ringed seal is not in danger of extinction throughout its range, but is likely to become so within the foreseeable future. Therefore, we are listing it as threatened.

*Baltic subspecies:* (1) Current estimates of 10,000 Baltic ringed seals suggest that the population has been significantly reduced from historical numbers. It has been estimated that about 180,000 ringed seals inhabited the Baltic Sea in 1900 and that by the 1940s this population had been reduced to about 25,000. (2) Reduced productivity in the Baltic subspecies in recent decades resulted from impaired fertility associated with pollutants. (3) Dramatic reductions in sea ice extent are projected by mid-century and beyond in the Baltic Sea, coupled with declining depth and insulating properties of snow

cover on Baltic Sea ice. The Baltic Sea is bounded to the north by land, which will limit the ability of Baltic ringed seals to respond to deteriorating sea ice and snow conditions by shifting their range northward. (4) Although Baltic ringed seals have been reported resting on island shores or offshore reefs during the ice-free season, we are not aware of any occurrence of ringed seals whelping or nursing young on land. (5) The Baltic ringed seal's pupping and nursing seasons are adapted to the phenology of ice and snow. The projected substantial reductions in sea ice extent and deteriorating snow conditions are expected to lead to decreased survival of pups and a substantial decline in the abundance of the Baltic subspecies. We have determined that the Baltic subspecies of the ringed seal is not in danger of extinction throughout all its range, but is likely to become so within the foreseeable future. Therefore, we are listing it as threatened.

*Ladoga subspecies:* (1) The population size of the ringed seal in Lake Ladoga is currently estimated at 3,000 to 5,000 seals, a decrease from estimates of 20,000 seals reported for the 1930s, and estimates of 5,000 to 10,000 seals in the 1960s. (2) Reduced ice and snow cover are expected in Lake Ladoga within this century based on regional projections. As ice and snow conditions deteriorate, the landlocked population of Ladoga ringed seals will be unable to respond by shifting its range. (3) Although Ladoga ringed seals have been reported resting on rocks and island shores during the ice-free season, we are not aware of any occurrence of ringed seals whelping or nursing young on land. (4) The Ladoga ringed seal's pupping and nursing seasons are adapted to the phenology of ice and snow. Reductions in ice and snow are expected to lead to decreased survival of pups and a substantial decline in the abundance of this subspecies. (5) Ongoing mortality incidental to fishing activities is also a significant conservation concern. Based on the substantial threats currently affecting Ladoga ringed seals at a significant level across the range of this subspecies, the high likelihood that the severity of the impacts of deteriorating snow and ice conditions will increase for this subspecies in the foreseeable future, and the fact that the subspecies is landlocked and will be unable to respond to habitat loss by dispersing to new habitat, we have determined that the Ladoga ringed seal is in danger of extinction throughout all of its range. Therefore, we are listing it as endangered.

**Significant Portion of the Range Evaluation**

Under the ESA and our implementing regulations, a species warrants listing if it is endangered or threatened throughout all or a significant portion of its range. In our analysis for this final rule, we initially evaluated the status of and threats to the Arctic, Okhotsk, and Baltic subspecies throughout their entire ranges. We found that the consequences of habitat change associated with a warming climate can be expected to manifest throughout the current breeding and molting ranges of ringed seals, and that the ongoing and projected changes in sea ice habitat pose significant threats to the persistence of these subspecies. The magnitude of the threats posed to the persistence of ringed seals, including from changes in sea ice habitat, are likely to vary to some degree across the range of the species depending on a number of factors, including where affected populations occur. In light of the potential differences in the magnitude of the threats to specific areas or populations, we evaluated whether the Arctic, Okhotsk, or Baltic subspecies might be in danger of extinction in any significant portions of their ranges. In accordance with our draft policy on ''significant portion of its range,'' our first step in this evaluation was to review the entire supporting record for this final determination to ''identify any portions of the range[s] of the [subspecies] that warrant further consideration'' (76 FR 77002; December 9, 2011). We evaluated whether substantial information indicated ''that (i) the portions may be significant [within the meaning of the draft policy] and (ii) the species [occupying those portions] may be in danger of extinction or likely to become so within the foreseeable future'' (76 FR 77002; December 9, 2011). Under the draft policy, both considerations must apply to warrant listing a species as endangered throughout its range based upon threats within a portion of the range. In other words, if either consideration does not apply, we would not list a species as endangered based solely upon its status within a significant portion of its range. For the Arctic and Okhotsk subspecies, we found it more efficient to address the status question first, whereas for the Baltic subspecies, we found it more efficient to address the significance question first.

The consequences of the potential threats to the Arctic and Okhotsk subspecies, including from changes in sea ice habitat, have been addressed in other sections of the preamble to this final rule. Based on our review of the record, we did not find substantial information indicating that any of the threats to the Arctic and Okhotsk subspecies, including those associated with the changes in sea ice habitat, are so severe or so concentrated as to indicate that either subspecies currently qualifies as endangered within some portion of its range. As described in our *Listing Determinations,* the threats are such that we concluded that Arctic and Okhotsk ringed seals are likely to become endangered within the foreseeable future. As a result, we find that the best available data show that there are no portions of their ranges in which the threats are so concentrated or acute as to place those portions of the ranges of either subspecies in danger of extinction. Because we find that the Arctic and Okhotsk subspecies are not endangered in any portions of their ranges, we need not address the question of whether any portions may be significant.

About 75 percent of the Baltic population is found in the Gulf of Bothnia (Bothnian Bay) in the northern Baltic Sea, while considerably smaller portions of the population are found in the Gulf of Riga and Gulf of Finland (15 percent and 5 percent of Baltic ringed seals, respectively; Ministry of Agriculture and Forestry, 2007). Palo *et al.* (2001) noted that the Baltic Sea subspecies has recently been fragmented into these three breeding segments, but that genetic evidence of the separation is not yet evident. Recent population increases in the Baltic subspecies have been attributed entirely to the Gulf of Bothnia portion of the population, while little growth rate or possible declines have been suggested for ringed seals in the Gulf of Finland and Gulf of Riga (Harkonnen *et al.,* 2008; Karlsson *et al.,* 2008). We conclude that the best information available does not suggest that declines in or loss of the Gulf of Finland and/or Gulf of Riga portion(s) would result in a substantial decline in the rest of the subspecies. We find that: (1) there is substantial information indicating that the Gulf of Bothnia may be a significant portion of the Baltic ringed seal's range; and (2) the Gulf of Finland and Gulf of Riga are not so significant that the decline or loss of these portions of the range would leave the remainder of the subspecies in danger of extinction, and thus they do not constitute significant portions of the Baltic ringed seal's range.

The consequences of the potential threats to the Baltic subspecies, including from climate change, have been addressed in other sections of the

preamble to this final rule. As described in our *Listing Determinations,* the threats are such that we concluded that Baltic ringed seals are likely to become endangered within the foreseeable future. We do not have any information that would lead to a different conclusion for ringed seals in the Gulf of Bothnia. Therefore, we find that the Gulf of Bothnia portion of the Baltic subspecies' range is not in danger of extinction, but is likely to become so within the foreseeable future.

**Prohibitions and Protective Measures**

Section 9 of the ESA prohibits the take of endangered species. The term ''take'' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or engage in any such conduct (16 U.S.C. 1532(19)). In the case of threatened species, ESA section 4(d) authorizes NMFS to issue regulations it considers necessary and advisable for the conservation of the species. Such regulations may include any or all of the section 9 prohibitions. These regulations apply to all individuals, organizations, and agencies subject to U.S. jurisdiction. On December 10, 2010, we proposed protective regulations pursuant to section 4(d) to include all of the prohibitions in section 9(a)(1) (75 FR 77476) based on a preliminary finding that such measures were necessary and advisable for the conservation of the threatened subspecies of the ringed seal.

In light of public comments and upon further review, we are withdrawing the proposed ESA section 4(d) protective regulations for ringed seals. We received comments arguing against adoption of the 4(d) rule and we have not received any information, and are not aware of any, indicating that the addition of the ESA section 9 prohibitions would apply to any activities that are currently unregulated and are having, or have the potential to have, significant effects on the Arctic, Okhotsk, or Baltic subspecies. Further, the Arctic, Okhotsk, and Baltic subspecies appear sufficiently abundant to withstand typical year-to-year variation and natural episodic perturbations in the near term. The principal threat to these subspecies of ringed seals is habitat alteration stemming from climate change within the foreseeable future. This is a long-term threat and the consequences for ringed seals will manifest themselves over the next several decades. Finally, ringed seals currently benefit from existing protections under the MMPA, and activities that may take listed species and involve a Federal action will still be subject to consultation under section 7(a)(2) of the ESA to ensure such actions will not jeopardize the continued existence of the species. We therefore conclude that it is unlikely that the proposed section 4(d) regulations would provide appreciable conservation benefits. As a result, we have concluded that the 4(d) regulations are not necessary at this time. Such regulations could be promulgated at some future time if warranted by new information.

Section 7(a)(2) of the ESA requires Federal agencies to consult with us to ensure that activities they authorize, fund, or conduct are not likely to jeopardize the continued existence of a listed species or a species proposed for listing, or to adversely modify critical habitat or proposed critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with us. Examples of Federal actions that may affect Arctic ringed seals include permits and authorizations relating to coastal development and habitat alteration, oil and gas development (including seismic exploration), toxic waste and other pollutant discharges, and cooperative agreements for subsistence harvest.

For the Ladoga subspecies of the ringed seal that we are listing as endangered, take will be prohibited under section 9 of the ESA. Sections 10(a)(1)(A) and (B) of the ESA provide us with authority to grant exceptions to the ESA's section 9 ''take'' prohibitions. Section 10(a)(1)(A) scientific research and enhancement permits may be issued to entities (Federal and non-Federal) for scientific purposes or to enhance the propagation or survival of a listed species. The type of activities potentially requiring a section 10(a)(1)(A) research/enhancement permit include scientific research that targets ringed seals. Section 10(a)(1)(B) incidental take permits are required for non-Federal activities that may incidentally take a listed species in the course of otherwise lawful activity.

**Identification of Those Activities That Would Constitute a Violation of Section 9 of the ESA**

On July 1, 1994, NMFS and FWS published a series of policies regarding listings under the ESA, including a policy for peer review of scientific data (59 FR 34270) and a policy to identify, to the maximum extent possible, those activities that would or would not constitute a violation of section 9 of the ESA (59 FR 34272). The intent of this policy is to increase public awareness of the effect of our ESA listing on proposed and ongoing activities within the species' range. We identify, to the extent known, specific activities that will be considered likely to result in violation of section 9, as well as activities that will not be considered likely to result in violation. Because the Ladoga ringed seal occurs outside the jurisdiction of the United States, we are presently unaware of any specific activities that could result in violation of section 9 of the ESA for this subspecies. However, we note that it is illegal for any person subject to the jurisdiction of the United States to ''take'' within the United States or upon the high seas, import or export, deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of a commercial activity, or to sell or offer for sale in interstate or foreign commerce, any endangered wildlife species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken in violation of the Act.

**Critical Habitat**

Section 3 of the ESA (16 U.S.C. 1532(5)(A)) defines critical habitat as: (i) specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed upon a determination by the Secretary that such areas are essential for the conservation of the species. Section 3 of the ESA also defines the terms ''conserve,'' ''conserving,'' and ''conservation'' to mean ''to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary.''

Section 4(a)(3) of the ESA requires that, to the extent practicable and determinable, critical habitat be designated concurrently with the listing of a species. Designation of critical habitat must be based on the best scientific data available, and must take into consideration the economic, national security, and other relevant impacts of specifying any particular area as critical habitat. Once critical habitat is designated, section 7 of the ESA requires Federal agencies to ensure that they do not fund, authorize, or carry out any actions that are likely to destroy or adversely modify that habitat. This requirement is in addition to the section 7 requirement that Federal agencies ensure their actions do not jeopardize the continued existence of the species.

In determining what areas qualify as critical habitat, 50 CFR 424.12(b) requires that NMFS ''consider those physical or biological features that are essential to the conservation of a given species including space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing of offspring; and habitats that are protected from disturbance or are representative of the historical geographical and ecological distribution of a species.'' The regulations further direct NMFS to ''focus on the principal biological or physical constituent elements * * * that are essential to the conservation of the species,'' and specify that the ''known primary constituent elements shall be listed with the critical habitat description.'' The regulations identify primary constituent elements (PCEs) as including, but not limited to: ''roost sites, nesting grounds, spawning sites, feeding sites, seasonal wetland or dryland, water quality or quantity, host species or plant pollinator, geological formation, vegetation type, tide, and specific soil types.''

The ESA directs the Secretary of Commerce to consider the economic impact, the national security impacts, and any other relevant impacts from designating critical habitat, and under section 4(b)(2), the Secretary may exclude any area from such designation if the benefits of exclusion outweigh those of inclusion, provided that the exclusion will not result in the extinction of the species. At this time, we lack the data and information necessary to identify and describe PCEs of the habitat of the Arctic ringed seal, as well as the economic consequences of designating critical habitat. In the proposed rule, we solicited information on the economic attributes within the range of the Arctic ringed seal that could be impacted by critical habitat designation, as well as the identification of the PCEs or ''essential features'' of this habitat and to what extent those features may require special management considerations or protection. However, few substantive comments were received in response to this request. We find designation of critical habitat for Arctic ringed seals to be not determinable at this time. We will propose critical habitat for Arctic ringed seals in a separate rulemaking. Because the known distributions of the Okhotsk, Baltic, and Ladoga subspecies of the ringed seal occur outside the jurisdiction of the United States, we will not propose critical habitat for Okhotsk, Baltic, or Ladoga ringed seals.

**Public Comments Solicited**

To ensure that subsequent rulemaking resulting from this final rule will be as accurate and effective as possible, we are soliciting information from the public, other governmental agencies, Alaska Natives, the scientific community, industry, and any other interested parties. Specifically, we request comments and information to help us identify: (1) The PCEs or ''essential features'' of critical habitat for Arctic ringed seals, and to what extent those features may require special management considerations or protection; as well as (2) the economic, national security, and other relevant attributes within the range of the Arctic ringed seal that could be impacted by critical habitat designation. Although the range of the Arctic ringed seal is circumpolar, regulations at 50 CFR 424.12(h) specify that critical habitat shall not be designated within foreign countries or in other areas outside U.S. jurisdiction. Therefore, we request information only on potential areas of critical habitat within the United States or waters within U.S. jurisdiction. You may submit this information by any one of several methods (see **ADDRESSES** and **DATES**). Comments and information submitted during the initial comment period on the December 10, 2010 proposed rule (75 FR 77476) or during the comment period on the peer review report (77 FR 20773; April 6, 2012) should not be resubmitted since they are already part of the record.

**Summary of Comments and Responses**

With the publication of the proposed listing determination for the Arctic, Okhotsk, Baltic, and Ladoga subspecies of the ringed seal on December 10, 2010 (75 FR 77476), we announced a 60-day public comment period that extended through February 8, 2011. We extended the comment period an additional 45 days in response to public requests (76 FR 6754; February 8, 2011). Also in response to public requests, including from the State of Alaska, we held three public hearings in Alaska in Anchorage, Barrow, and Nome (76 FR 9733, February 22, 2011; 76 FR 14882, March 18, 2011).

During the public comment periods on the proposed rule we received a total of 5,294 comment submissions in the form of letters via mail, fax, and electronically through the Federal eRulemaking portal. These included 5,238 form letter submissions and 56 other unique submissions. In addition, at the three public hearings we received testimony from 41 people and received written submissions from 12 people. Comments were received from U.S. State and Federal Agencies including the Marine Mammal Commission and the Alaska Department of Fish and Game (ADFG); government agencies of Canada, Nunavut, and Greenland; Native Organizations such as the Ice Seal Committee (ISC; Alaska Native co-management organization); environmental groups; industry groups; and interested individuals.

In accordance with our July 1, 1994, Interagency Cooperative Policy on Peer Review (59 FR 34270), we requested the expert opinion of four independent scientists with expertise in seal biology and/or Arctic sea ice and climate change regarding the pertinent scientific data and assumptions concerning the biological and ecological information use in the proposed rule. The purpose of the review was to ensure that the best biological and commercial information was used in the decision-making process, including input of appropriate experts and specialists. We received comments from three of these reviewers. Two of the reviewers questioned the magnitude and immediacy of the threats posed to Arctic ringed seals by the projected changes in sea ice habitat, in particular on-ice snow cover, while the third reviewer was generally supportive of the information and analyses underlying the determinations.

The differences of opinion amongst the peer reviewers, as well as uncertainty in the best available information regarding the effects of climate change, led NMFS to take additional steps to ensure a sound basis for our final determination on whether to list ringed seals under the ESA. To better inform our final listing determination and address the disagreement regarding the sufficiency or accuracy of the available data relevant to the determination, on December 13, 2011, we extended the deadline for the final listing decision by 6 months to June 10, 2012 (76 FR 77466). Subsequently, we conducted special independent peer review of the sections of the ringed seal status review report (Kelly *et al.,* 2010a) related to the disagreement. For this special peer review, we recruited two scientists with marine mammal expertise and specific knowledge of ringed seals, and two physical scientists with expertise in climate change and Arctic sea ice and snow to review these sections of the status review report and provide responses to specific review questions. We received comments from the two physical scientists and one of the marine mammal specialists. We

consolidated the comments received in a peer review report that was made available for comment during a 30-day comment period that opened April 6, 2012 (77 FR 20773). During this public comment period on the special peer review we received an additional 15 comment submissions via fax and electronically through the Federal eRulemaking portal.

We fully considered all comments received from the public and peer reviewers on the proposed rule in developing this final listing of the Arctic, Okhotsk, Baltic, and Ladoga subspecies of the ringed seal. Summaries of the substantive public and peer review comments that we received concerning our proposed listing determination for these subspecies, and our responses to all of the significant issues they raise, are provided below. Comments of a similar nature were grouped together where appropriate.

Some peer reviewers provided feedback of an editorial nature that noted inadvertent minor errors in the proposed rule and offered non-substantive but clarifying changes to wording. We have addressed these editorial comments in this final rule as appropriate. Because these comments did not result in substantive changes to the final rule, we have not detailed them here. In addition to the specific comments detailed below relating to the proposed listing rule, we also received comments expressing general support for or opposition to the proposed rule and comments conveying peer-reviewed journal articles, technical reports, and references to scientific literature regarding threats to the species and its habitat. Unless otherwise noted in our responses below, after thorough review, we concluded that the additional information received was considered previously or did not alter our determinations regarding the status of the four ringed seal subspecies.

*Peer Review Comments*

*Comment 1:* Four peer reviewers commented that the best available data on ringed seal demographics and current and past abundance are limited to poor or non-existent. Consequently, these reviewers noted that there is considerable uncertainty associated with these parameters, including in many areas of Canadian waters. In addition, one reviewer noted that results of ringed seal surveys reported by Kingsley *et al.* (1985) were not cited. One of the reviewers also commented that new information regarding the health and status of ringed seals in Alaska that became available after the proposed rule was published (*i.e.,* Quakenbush *et al.,* 2011) should be considered, and that this information indicates they are currently doing as well or better than they have since the 1960s. The State of Alaska submitted a summary of this information with its comments on the proposed rule, and also subsequently submitted a full copy of Quakenbush *et al.* (2011), commenting that these data indicate Arctic ringed seals are currently healthy.

*Response:* We agree that data on ringed seal demography and population size are limited. None of the published reports (including Kingsley *et al.,* 1985) provide reliable estimates of total or range-wide population size. We have taken Quakenbush *et al.'*s (2011) data (available at *http://alaskafisheries.noaa.gov/protectedresources/seals/ice.htm*) into consideration in reaching our final listing determination, and these data will be useful in future status reviews. We note, however, that healthy individual animals are not inconsistent with a population facing threats that would cause it to become in danger of extinction in the foreseeable future. For example, animals sampled from the endangered Western DPS of Steller sea lions have consistently been found to be healthy. In the case of ringed seals, substantial losses due to predation and hypothermia associated with reduced snow cover could not be detected by assessing the health of survivors. In fact, survivors might be expected to fare well for a period of time as a consequence of reduced competition.

*Comment 2:* A peer reviewer suggested that although the ringed seal population in the Sea of Okhotsk is reported to have been in a state of steady decline for 55 years, there are still a substantial number of seals estimated in this population. This reviewer noted that it is possible that the perceived decline reflects sampling error rather than an actual decline in abundance.

*Response:* We must base our listing decisions solely on the best scientific and commercial data available, after conducting a status review of the species and taking into account efforts to protect the species. Improved population estimates certainly are desirable. In the meantime, as discussed in the proposed rule and detailed in the status review report, the best available information indicates a decline for the Okhotsk subspecies from historical numbers.

*Comment 3:* Four peer reviewers expressed the view that the atmosphere-ocean general circulation models (AOGCMs) used for climate, sea ice, and snow prediction are not appropriate for directly linking to ringed seal habitat or for predicting snow on sea ice at a scale that is important for ringed seals. For example, some of these reviewers commented that the models: (1) Do not represent precipitation adequately, particularly at a local scale (one reviewer stated that it is well known that AOGCMs do not adequately predict precipitation, and two reviewers noted that some regional models predict precipitation poorly); (2) do not account for openings in the ice that are large sources of moisture and heat in the atmosphere, thus making winter precipitation prediction problematic; and (3) do not account for ice surface roughness caused by deformation in autumn through winter, or wind speeds and directions, which are critical to the distribution and accumulation pattern of snow on ice. Related comments of some of these reviewers suggested that increased deformation can be expected as ice forms later in the autumn and remains thinner throughout the winter, and that this could actually mean an improvement to Arctic ringed seal habitat. One of these reviewers pointed out that in addition, the projections of future Arctic snow cover are discussed in terms of the present climatology of snow over sea ice (*i.e.,* increased precipitation in autumn and spring, and less in winter). This reviewer suggested that snow climatology would be expected to change due to more open water later into the winter, which would provide a moisture source for increasing pulses of snow on sea ice in the autumn and perhaps through winter if the atmosphere remained warmer. Several public comments, including from the State of Alaska, Canada's Department of Fisheries and Oceans (DFO), and Nunavut's Department of Environment, expressed more general concerns about limitations with the model projections of snow cover, and some commenters also suggested that the model projections should be verified by field observations.

In contrast, a third peer reviewer commented that the model considered in the status review is the best source available for snow cover projections, and a commenter expressed a similar view. The commenter also noted that the snow depth findings of the status review are now supported by a new snow depth analysis by Hezel *et al.* (2012) that uses a more advanced suite of models from the Coupled Model Intercomparison Project Phase 5 (CMIP5; IPCC AR5) and suggested that this analysis addresses some of the

critiques raised in the special peer review.

*Response:* The model (CCSM3; IPCC) that we used to project snow depths includes the ice-thickness distribution and therefore accounts for sea ice deformation as a function of the sea ice compressive strength (resistance to compressive stresses; computed from the potential energy of the ice-thickness distribution) and the opening and closing rates of leads (linear cracks of open water in the ice) in the ice (computed from the ice motion field). The model has roughly 2 percent open water and 10 percent of the area with ice thickness less than 60 cm in the central Arctic in winter months. These aspects of the model are well documented in Holland *et al.* (2006). The consequence of resolving open water and thin ice allows for higher evaporation rates over these surfaces. The model shows a greater rate of evaporation as the sea ice concentration declines over the 21st century. This contributes to higher snowfall rates in winter (November–March).

Sea ice deformation rates in the CCSM3 indicate the 21st century will see increased deformation rates in regions where sea ice motion is towards the shore, such as north of Greenland and the Canadian Archipelago. As we noted in the proposed rule and the status review report, this region is projected to maintain summer sea ice cover during this century longer than any other. Though we agree that there may be a greater concentration of deformed ice in some regions where snow may collect, the CCSM3 (and other models analyzed by Hezel *et al.,* 2012) also predicts that snow depths will decrease on average in this region within this century. When ice floes (sheets of floating ice) converge, they first must fill in leads between the floes. Hence when there is more open water in the 21st century and only occasional converging events, there can be less rafting and ridging. Therefore, deformation is not expected to increase in frequency everywhere. For example, the projected deformation rate changes little in the CCSM3 in most of the Barents Sea and Siberian coastal regions.

As noted by a commenter, recently, Hezel *et al.* (2012) considered historical and 21st century snow depth changes on Arctic sea ice using 10 models from the CMIP5 that had snow depth data available. The model projections were compared with existing observations, and according to Hezel *et al.* (2012), the model projections were on average about 10 percent below observations, but about one-third of the individual models projected more snow than observed. Despite the broad range of snow depths among the 10 models over the 21st century, the models all agree that snow depths will decline substantially in the future, similar to the CCSM3. Snow depths decline faster in the models with greater initial depth, so the spread in the model projections declines over time, lending greater support for these forecasts. Hezel *et al.* (2012) discuss that over the 21st century, the loss of sea ice as a platform to collect snow in autumn and early winter (due to later sea ice formation) results in a substantial reduction in the amount of snow that can accumulate on sea ice, the primary concern that was also expressed in the status review report and the proposed rule. Hezel *et al.* (2012) also discuss that their analysis may underestimate future decreases in snow depths because decreases in autumn and winter sea ice concentrations could result in loss of drifting snow into leads, and the models also do not account for the effect of rainfall in winter and spring on net snow accumulation and melting.

We continue to conclude that the best available information suggests that the CCSM3 projects snow depth reasonably well. We note, for example, that snow depths from the CCSM3 are consistent with measured snow in the Arctic Ocean (Radionov *et al.,* 1997) and Hudson Bay (Ferguson *et al.,* 2005). The resolution of the model projections of snow is certainly limited, but the CCSM3 and more recent model results point unequivocally to less snow accumulation on the ice throughout the range of the species. The reviewers/commenters did not present—and we are not aware of—evidence that snow accumulation is likely to increase at any scale that would likely be helpful for ringed seal populations responding to the expected climate warming.

*Comment 4:* A peer reviewer commented that fast (shorefast) ice conditions are not considered adequately in any of the AOGCMs used. This reviewer expressed the opinion that this is a key problem with the assessment because a significant amount of Arctic ringed seal habitat is related to fast ice, and fast ice zones will also be less affected than marginal ice zones.

*Response:* The sea ice dynamical schemes used in AOGCMs (including the CCSM3) have regions of very slow moving ice, though not perfectly rigid. These regions exhibit little deformation and lead openings in AOGCMs. NMFS did not use AOGCMs to estimate changes to the fast ice area. Instead, we used AOGCMs to estimate changes to snow depth and sea ice area. Nevertheless, the status review report indicated that there is already clear evidence of advancement in the break-up date of fast ice and the onset of snow melt in several parts of the Arctic (*e.g.,* Ferguson *et al.,* 2005; Kelly *et al.,* 2006). No evidence was found by the BRT or presented by the peer reviewers or other commenters that indicates these trends are likely to abate or reverse. Early break up and early snow melt dates have clearly been associated with poor survival of ringed seal young. Therefore, these trends are likely to result in reduced productivity, resilience, and abundance of the Arctic ringed seal population, despite the fact that the models do not explicitly distinguish fast ice from pack ice (both of which are important ringed seal habitats).

*Comment 5:* A peer reviewer, as well as Canada's DFO, noted observations of regional snow conditions and ringed seal pupping that they suggested may conflict with the model projections of snow depths and the 20 cm minimum snow depth criterion identified for ringed seal birth lairs. The reviewer pointed out that based on CCSM3 model projections presented in the status review report, average April snow depths on sea ice for the first decade of this century in Hudson Bay appear to be below 20 cm, which she suggested implies longer-term reproductive failure in this population than the decline and/or perhaps decadal cycles suggested by the available data. In addition, this reviewer noted that loss of sea ice and snow can vary regionally, and that this needs to be taken into consideration in evaluating impacts. A few public comments also pointed out what were believed to be discrepancies in some regions between the model projections of snow depths and local observations, and expressed the view that a model that does not agree with current conditions should not be used to project future conditions. For example, these comments noted that: (1) Ringed seals continue to occupy and reproduce in the northern Bering Sea, while the model projections suggest that snow depths are currently below 20 cm in these areas; and (2) the observed trend in annual snowfall accumulation since the 1980s in the vicinity of Barrow shows a clear upward trend, with levels similar to or exceeding those recorded during previous periods when ringed seals successfully maintained lairs.

*Response:* The models should be interpreted as indicating trends in conditions when averaged over large areas. There may well be local or regional variation sufficient to produce locally different trends. A single model is prone to large errors on the scale of

a few hundred kilometers. For example, the CCSM3 has too much sea ice area in the Sea of Okhotsk and in the Labrador Sea. On the scale of the Northern Hemisphere, the errors across these regions cancel somewhat. Another appropriate use of a model is to evaluate agreement across regions. Although the rate of change varies by region, the CCSM3 has snow depth decreasing everywhere, which lends support for the projected direction of future change.

*Comment 6:* A peer reviewer expressed the opinion that insufficient consideration is given to the greater role that the Arctic Archipelago will likely play as an ice retention zone over the coming decades.

*Response:* The proposed rule noted that the Arctic Archipelago is predicted to become an ice refuge through the end of this century. Indeed, the Archipelago ''will likely play'' a ''greater role'' in ringed seal habitat ''over the coming decades,'' but not because habitat will improve there (snow accumulation, for example, is projected to decline). Rather, the Archipelago's increased role will reflect greater losses of ice and snow elsewhere in the Arctic. In other words, the Archipelago is projected to be the last possible remnant of suitable habitat, although we do not know how suitable or for how long.

*Comment 7:* A peer reviewer expressed the opinion that use of temperatures as a proxy for projecting sea ice conditions in the Sea of Okhotsk appears problematic given that: (1) The climate models did not perform satisfactorily at projecting sea ice, and sea ice extent is strongly controlled by temperature; and (2) temperature itself is strongly controlled by sea ice conditions.

*Response:* The decision to use temperature as an indicator for the presence of ice is a geographic size issue. While the climate models' grid size is too coarse to develop full sea ice physics for the Sea of Okhotsk, these models are able to resolve temperature, which is mostly controlled by large-scale weather patterns on the order of 500 km or more. As the reviewer notes, sea ice extent is strongly controlled by temperature; this is especially true for smaller bodies of water relative to the grid size of available models. Thus, whether the whole geographic region around the Sea of Okhotsk is above or below the freezing point of sea water should be a reasonable indicator of the presence or absence of sea ice.

*Comment 8:* A peer reviewer suggested that climate models capable of adequately capturing fast ice formation, the physics of snow precipitation, and the catchment of snow should be a high priority for development.

*Response:* We agree with this recommendation.

*Comment 9:* A peer reviewer expressed the view that climate model predictions should not be considered beyond mid-century because they rely on assumptions about future policy decisions that will affect GHG emissions and are thus highly speculative. Related public comments, including from the State of Alaska, noted that NMFS's recent ESA listing determination for the ribbon seal and a subsequent court decision concluded that projections of climate scenarios beyond 2050 are too heavily dependent on socioeconomic assumptions and are therefore too divergent for reliable use in assessing threats to the species. Two reviewers and several commenters expressed the opinion that trying to predict the response of seals to environmental change beyond mid-century increases the uncertainty unreasonably. A reviewer and several public comments also pointed out that assessing impacts to ringed seals from climate change through the end of this century is inconsistent with: (1) Other recent ESA determinations for Arctic species, such as ribbon seal and polar bear, that considered species responses through mid-century; (2) the IUCN red list process, which uses a timeframe of three generation lengths; and (3) the mid-century timeframe considered to evaluate environmental responses of marine mammals to climate change in a special issue (March 2008) of the journal Ecological Applications (Walsh, 2008). A few commenters expressed the opinion that the altered approach is significant because the listing determinations are wholly dependent upon NMFS's use of a 100-year foreseeable future. Several commenters expressed the opinion that inadequate justification was provided for NMFS's use of a 100-year foreseeable future. Many of these commenters suggested that the best scientific data support a ''foreseeable future'' time frame of no more than 50 years, and some commenters such as the State of Alaska suggested a shorter time horizon of no more than 20 years. In contrast, another peer reviewer and some commenters expressed support for use of climate model projections through the end of the 21st century.

*Response:* The ESA requires us to make a decision as to whether the species under consideration is in danger of extinction throughout all or a significant portion of its range (endangered), or is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (threatened) based on the best scientific and commercial data available. While we may consider the assessment processes of other scientists (*i.e.,* IUCN; Walsh, 2008), we must make a determination as to whether a species meets the definition of threatened or endangered based upon an assessment of the threats according to section 4 of the ESA. We have done so in this rule, using a threat-specific approach to the ''foreseeable future'' as discussed below and in the proposed listing rule.

In the December 30, 2008, ribbon seal listing decision (73 FR 79822) the horizon of the foreseeable future was determined to be the year 2050. The reasons for limiting the review to 2050 included the difficulty in incorporating the increased divergence and uncertainty in future emissions scenarios beyond this time, as well as the lack of data for threats other than those related to climate change beyond 2050, and that the uncertainty inherent in assessing ribbon seal responses to threats increased as the analysis extended farther into the future. By contrast, in our more recent analyses for spotted, ringed, and bearded seals, we did not identify a single specific time as the foreseeable future. Rather, we addressed the foreseeable future based on the available data for each respective threat. This approach better reflects real conditions in that some threats (*e.g.,* disease outbreaks) appear more randomly through time and are therefore difficult to predict, whereas other threats (climate change) evince documented trends supported by paleoclimatic data from which reasonably accurate predictions can be made farther into the future. Thus, the time period covered for what is reasonably foreseeable for one threat may not be the same for another. The approach is also consistent with the memorandum issued by the Department of Interior, Office of the Solicitor, regarding the meaning of the term ''foreseeable future'' (Opinion M–37021; January 16, 2009). In consideration of this modified threat-specific approach, NMFS initiated a new status review of the ribbon seal on December 13, 2011 (76 FR 77467).

As discussed in the proposed listing rule, the analysis and synthesis of information presented in the IPCC's AR4 represents the scientific consensus view on the causes and future of climate change. The IPCC's AR4 used state-of-the-art AOGCMs under six ''marker'' scenarios from the Special Report on Emissions Scenarios (SRES; IPCC, 2000) to develop climate projections under

clearly stated assumptions about socioeconomic factors that could influence the emissions. Conditional on each scenario, the best estimate and likely range of emissions were projected through the end of the 21st century. In our review of the status of the ringed seal, we considered model projections of sea ice developed using the A1B scenario, a medium ''business-as-usual'' emissions scenario, as well the A2 scenario, a high emissions scenario, to represent a significant range of variability in future emissions.

We also note that the SRES scenarios do not assume implementation of additional climate initiatives beyond current mitigation policies. This is consistent with consideration of ''existing'' regulatory mechanisms in our analysis under ESA listing Factor D. It is also consistent with our Policy on Evaluating Conservation Efforts (68 FR 15100; March 28, 2003), which requires that in making listing decisions we consider only formalized conservation efforts that are sufficiently certain to be implemented and effective.

The model projections of global warming (defined as the expected global change in surface air temperature) out to about 2040–2050 are primarily due to emissions that have already occurred and those that will occur over the next decade. Thus conditions projected to mid-century are less sensitive to assumed future emissions scenarios. For the second half of the 21st century, however, the choice of an emissions scenario becomes the major source of variation among climate projections. As noted above, in our 2008 listing decision for ribbon seal, the foreseeable future was determined to be the year 2050. The identification of mid-century as the foreseeable future took into consideration the approach taken by FWS in conducting its status review of the polar bear under the ESA, and the IPCC assertion that GHG levels are expected to increase in a manner that is largely independent of assumed emissions scenarios until about the middle of the 21st century, after which the emissions scenarios become increasingly influential.

Subsequently, in the listing analyses for spotted, ringed, and bearded seals, we noted that although projections of GHGs become increasingly uncertain and subject to assumed emissions scenarios in the latter half of the 21st century, projections of air temperatures consistently indicate that warming will continue throughout the century. Although the magnitude of the warming depends somewhat on the assumed emissions scenario, the trend is clear and unidirectional. To the extent that the IPCC model suite represents a consensus view, there is relatively little uncertainty that warming will continue. Because sea ice production and persistence is related to air temperature through well-known physical processes, the expectation is also that loss of sea ice and reduced snow cover will continue throughout the 21st century. Thus, the more recent inclusion of projections out to the year 2100 reflects NMFS's intention to use the best and most current data and analytical approaches available. AOGCM projections consistently show continued reductions in ice extent and multi-year ice (ice that has survived at least one summer melt season) throughout the 21st century (*e.g.,* Holland *et al.,* 2006; Zhang and Walsh, 2006; Overland and Wang, 2007), albeit with a spread among the models in the projected reductions. In addition, as discussed by Douglas (2010), the observed rate of Arctic sea ice loss has been reported as greater than the collective projections of most IPCC-recognized AOGCMs (*e.g.,* Stroeve *et al.,* 2007; Wang and Overland, 2009), suggesting that the projections of sea ice declines within this century may in fact be conservative.

We concluded that in this review of the status of the ringed seal, the climate projections in the IPCC's AR4, as well as the scientific papers used in this report or resulting from this report, represent the best scientific and commercial data available to inform our assessment of the potential impacts from climate change. In our risk assessment for ringed seals, we therefore considered the full 21st century projections to analyze the threats stemming from climate change. We continue to recognize that the farther into the future the analysis extends, the greater the inherent uncertainty, and we incorporated that consideration into our assessments of the threats and the species' responses to the threats.

*Comment 10:* Three peer reviewers expressed the opinion that the potential for ringed seals to modify their behavior in response to climate conditions is underestimated. These reviewers suggested that plasticity in ringed seal life-history activities includes variability in timing of reproduction and molting relative to changes in the ice and snow cover season; the ability to survive slightly shortened nursing periods; and the ability to migrate over long distances, to use alternative platforms to haul out on, and to use alternative food resources. One reviewer noted that changes in Ladoga and Saimaa seal reproductive behavior in recent history (*e.g.,* increased use of shorelines for lair construction) also demonstrate adaptive responses. The resilience and adaptability of ringed seals was also noted in several public comments, including those of Canada's DFO, Nunavut's Department of Environment, and Greenland's Department of Fishing, Hunting, and Agriculture (DFHA). In addition, a related public comment expressed the view that the determination appears to contradict NMFS's emphasis in its recent ESA listing determinations for ribbon and spotted seals on the ability of ice seals to adapt to declines in sea ice.

*Response:* Presumably the reviewers are referring to phenotypic plasticity, which is the ability of an individual genotype (genetic composition) to produce multiple phenotypes (observable characteristics or traits) in response to its environment. Plasticity in the timing of ringed seal reproduction and molting is not established. More importantly, the BRT would predict population reductions as habitat changes (*i.e.,* depth and duration of ice and especially snow cover decreases) require changes in the timing of reproduction and molting, decreased nursing periods, changes in migration, use of alternative haul-out substrates, and changes in diet. If the reviewers are arguing that ringed seal populations might persist in the face of such changes, we agree. If the reviewers are suggesting that ringed seal populations would not be expected to decline significantly in the face of such changes, we disagree.

*Comment 11:* A peer reviewer commented that regional variation in the minimum snow depth required for Arctic ringed seal lair construction and maintenance is an important consideration, and noted that the ambient temperatures and primary predator in a particular region may influence the minimum snow drift depth needed for birth lair formation and maintenance. This reviewer discussed that ringed seal birth lairs have been successfully constructed in drifts shallower than 45 cm, with corresponding snow depths on flat ice of less than 20 cm, in some parts of the subspecies' range, and also noted how difficult it is to measure snow depth and how poor the data coverage is across various parts of the Arctic ringed seal's range. A commenter expressed the opinion that given the reviewer's emphasis on regional variation, 20 cm average snow depth might not be adequate in many regions. This commenter also noted that Ferguson *et al.* (2005) found a minimum of 32 cm average snow depth was needed for lairs in western Hudson Bay.

*Response:* We recognize that there is some uncertainty in measurement of snow depth and in identifying a threshold depth (measured as the average accumulation of snow on flat ice) for adequate recruitment of ringed seals. The minimum adequate snow depth is unlikely to be a sharp threshold, so that there will no doubt be many cases in which successful lairs have been created and maintained in snow shallower than the threshold, and also many cases where ringed seals have succumbed to predation or exposure in lairs made in deeper snow. Also, there may be regional differences in this threshold depth, though the examples that were cited in the status review report and the proposed rule, and used to estimate the snow depth threshold, included documentation of predation by bears, foxes, and birds. However, our conclusions were based primarily on the expectation that snow depths will decrease substantially in the coming decades, and that poor survival of young seals has already been documented in recent years with early break-up or onset of snow melt. No compelling evidence was received during the peer reviews and public comment periods to indicate that these impacts are likely to abate or reverse, or that they are expected to be isolated to particular regions. We discussed in the preamble to the proposed rule that the best available estimate of the minimum average snow depth (on flat ice) for the formation of birthing lairs is at least 20–30 cm, and we considered areas projected to have less than 20 cm average snow depth in April to be inadequate for the formation of ringed seal birth lairs. However, the conclusion that snow habitat will decline substantially throughout the ringed seal's range was not highly dependent on that specific value.

*Comment 12:* A peer reviewer commented that while the observations reported of the effects of extreme weather events on Arctic ringed seals are important to consider, there are relatively few data on how these habitat effects are influencing longer-term reproductive potential and population dynamics need to be considered in the proper geographic and temporal context. This reviewer noted that these observations are also for Arctic ringed seals in the southern extent of their range and in the western Arctic, where ringed seals are expected to be more strongly affected by climate change. Therefore, they need to be considered in the proper geographic and temporal context.

*Response:* Long-term data on population dynamics of ice-associated seals would be prohibitively difficult and expensive to acquire. Therefore, it is critical and required by the ESA to make use of existing data, which include observations from years or short periods of extreme conditions, as analogs for projected future trends. As the reviewer noted, it is important to keep in mind possible limitations of this approach, including the geographic and temporal contexts. Although several of the key studies relating ringed seal vital rates to environmental conditions do come from southern parts of the species' distribution, the conditions encountered in those studies did not exceed the values for temperatures, minimum snow depths, and ice break-up dates that are anticipated in the coming decades throughout most of the Arctic ringed seal's range.

*Comment 13:* A peer reviewer suggested that the assumption that inadequate snow depths and warmer temperatures will cause high pup mortality due to the loss of thermal protection is based on very limited data. This reviewer also commented that ringed seal pups may not need lairs for thermal protection to the same degree as temperatures warm, which may be why ringed seals successfully pup without lairs in the Sea of Okhotsk. Another reviewer commented that the thermal benefit of lairs appears secondary to predator avoidance. A related public comment noted that some data on seal pup mortality due to hypothermia (*i.e.,* Hammill and Smith, 1991) suggest that seal pups are largely unaffected by the snow depth of subnivean lairs, and are in fact much more tolerant of temperature extremes than suggested.

*Response:* Substantial data indicate high pup mortality due to hypothermia and predation as a consequence of inadequate snow cover (Kumlien, 1879; Lydersen *et al.,* 1987; Lydersen and Smith, 1989; Smith *et al.,* 1991; Smith and Lydersen, 1991; Hammill and Smith, 1989; Hammill and Smith, 1991). The suggestion that ringed seals may not need lairs to the same degree as temperatures warm is overly simplistic. Unseasonal warming and rains will become increasingly common as the climate warms, and such events have led to high pup mortality when collapse of lairs was followed by a return to cold temperatures (Lukin and Potelov, 1978; Stirling and Smith, 2004; Ferguson *et al.,* 2005). Whether one benefit is secondary or not, the preamble to the proposed rule summarized considerable data that was detailed in the status review report indicating that lairs protect seals from both cold and predators.

*Comment 14:* A peer reviewer suggested that the climate model projections of snow cover indicate it is highly likely sufficient snow will be available to Arctic ringed seals in the foreseeable future during the key months when reproduction is likely to occur.

*Response:* As discussed in the preamble to the proposed rule, contrary to this reviewer's suggestion, by the end of the century, April snow cover is projected to become inadequate for the formation and occupation of ringed seal birth lairs over much of the Arctic ringed seal's range.

*Comment 15:* A peer reviewer commented that the increasing probability of spring precipitation coming in the form of rain during the critical birth lair period (*i.e.,* April) is of particular concern.

*Response:* This concern (*i.e.,* potential for spring rain to damage lairs) was identified in the preamble to the proposed rule and was acknowledged and considered by the BRT in its risk assessment (see Kelly *et al.,* 2010a). We note that Hezel *et al.* (2012) reported a projected increase in rainfall in April and May through the end of this century.

*Comment 16:* One of the peer reviewers expressed the opinion there should be more focus on the seasonal thresholds and types of ice that are thought to be important for ringed seals, as some thresholds are likely to be more critical than others. This reviewer suggested this type of synthesis is needed to evaluate how important changing ice extent, thickness, and presence of multiyear ice will be in the future. For example, a change in ice thickness in core Arctic habitat may be less significant than a change in freeze-up dynamics that affects ice roughness and subsequent snow drift development in the medium and long-term.

*Response:* A multi-factorial model of the impacts of ice extent, thickness, and ice type on ringed seal populations would be desirable. However, we are not aware of any time series or other data sets that could be used in such an analysis.

*Comment 17:* A peer reviewer noted there are few data on what proportion of the habitat identified as ''suitable'' is actually used by Arctic ringed seals, and commented that without this information it is difficult to evaluate the impact of ice loss. This reviewer suggested that in core Arctic areas, availability of ice may not be a limiting factor, even with changes in the short and medium term.

*Response:* The greatest uncertainty about areas actually used by ringed seals

is with respect to the offshore areas, especially the central Arctic Basin. Along the coasts and in the marginal seas, there is relatively good evidence that ringed seals are currently widespread if not ubiquitous in areas with regular presence of suitable winter ice and snow cover. Many of these areas are projected to become unsuitable within the 21st century. Because potentially suitable sea ice and snow are projected to be present in parts of core Arctic areas longer than in other areas of the Arctic ringed seal's range, ringed seals may be affected later in these areas. Nevertheless, reductions in snow depths are projected throughout the Arctic ringed seal's range, including in core Arctic areas, such that Arctic ringed seals are threatened by the anticipated habitat changes throughout their range.

*Comment 18:* A peer reviewer commented that considerable emphasis is placed on the projected loss of multi-year and seasonal ice cover. However, this reviewer noted that Arctic ringed seals avoid multi-year ice, instead preferring stable first-year ice and stable pack ice, and they only require ice during breeding and possibly molting. In addition, the reviewer commented that how Arctic ringed seals might respond to replacement of multi-year sea ice by seasonal first-year ice is not sufficiently considered, noting that although the Arctic Basin has relatively low productivity, it is unclear whether this will remain the case in the future. Another peer reviewer and Greenland's DFHA both commented that the translation of multi-year ice into more first-year ice could actually increase the amount of ringed seal habitat.

A few commenters, including Canada's DFO, similarly suggested that some habitat changes caused by projected changes in climatic conditions, such as increased open water foraging areas, may be beneficial to ringed seals. One commenter expressed the opinion that NMFS arbitrarily adopted a precautionary approach that assumed the worst possible future habitat conditions without taking into account any future potential habitat gains. This commenter also stated that it was unclear why NMFS provided the special peer reviewers of the bearded seal status review a supplemental analysis that highlighted habitat losses and gains based on the sea ice concentration criteria, but did not provide a similar analysis for ringed seals.

*Response:* As discussed above, we used AOGCM projections to estimate changes to snow depth and sea ice area throughout the range of Arctic ringed seals. Thus, our analysis did not place particular emphasis on certain ages or types of ice. NMFS considered the impacts of an increased proportion of Arctic ice being made up of first-year ice. Indeed, first-year ice is predicted to form progressively later in fall, after much of the annual snow has already fallen, so snow depths are projected to be diminished on first-year ice as well. An increase in the proportion of first-year ice would not be beneficial to ringed seal breeding and pup survival if snow depths on the new regions of first-year ice are insufficient for lair creation and maintenance.

We agree that ongoing climate disruption and warming may cause some habitat changes that could be beneficial to ringed seals. However, a shift from unsuitable to suitable values of a few habitat dimensions is not a strong indication that other habitat will become suitable overall. For example, if Arctic ringed seals move north with retreating ice and occupy new areas, they may encounter less prey availability in the deeper, less productive Arctic Basin. The reviewer's assertion that the Arctic Basin may become more productive is highly speculative; unlike the physical models used to predict ice and snow, there is not a broad scientific consensus on the general direction of the expected trends.

We are not aware of any documented examples of ice-associated species expanding into previously unsuitable habitat that has become suitable due to climate or other large-scale shifts in conditions. Therefore, we conclude that it is more likely that losses of current habitat will outweigh any potential habitat gains. We also note that as ice and snow cover decline, Arctic waters may become more hospitable to species like spotted and harbor seals that do not depend on snow-covered ice for breeding. So, as breeding habitat declines for ringed seals, they may also face greater competition for food.

Regarding the supplemental analysis provided to the special peer reviewers of the bearded seal status review report, that analysis summarized the projected changes in areas of suitable bearded seal habitat based on sea ice concentration and bathymetry criteria during the months of reproduction and molting, both including and excluding areas of potential habitat gains. Possible habitat gains for bearded seals were described as areas where sea ice concentrations were currently too dense to be considered suitable, but where projected future concentrations fall within the suitable range. For ringed seals, a key consideration in evaluating the potential impacts of the projected changes in ice and snow is sufficient snow depth for the formation and maintenance of lairs. We considered areas projected to have less than 20 cm of average snow depth in April to be inadequate for the formation of ringed seal birth lairs. Model projections indicate that throughout the range of ringed seals there will be a substantial reduction in on-ice snow cover within this century. Therefore, a supplemental analysis similar to the one provided to the bearded seal special peer reviewers would not have indicated any potential gains in suitable habitat in terms of areas with snow depths sufficient for ringed seal birth lairs in April.

*Comment 19:* A peer reviewer noted that there was discussion in the status review report of limited evidence suggesting lack of a suitable ice platform may lead to a delayed molt. This reviewer commented that this should be discussed, along with the longer term impact from a survival aspect. The Marine Mammal Commission submitted a related comment that the projected loss of ice poses a threat to molting Arctic ringed seals that should not be overlooked. The Commission noted that failure of ice in a molting area may mean that seals are forced to spend more time in the water, where they must expend more energy to maintain body temperature-energy that does not go to the production of a new coat.

*Response:* The limited evidence suggesting that a lack of suitable ice may lead to a delayed molt was discussed in the status review report. The BRT considered the threat posed from decreases in sea ice habitat suitable for molting as moderately significant to the persistence of Arctic, Baltic, and Ladoga ringed seals, and moderately to highly significant to the persistence of Okhotsk ringed seals (Tables 5–8; Kelly *et al.,* 2010a).

*Comment 20:* A peer reviewer commented that given what is known about the relatively diverse diet of Arctic ringed seals in different regions and the potential for new species of forage fish to shift northward, it is very difficult to predict how quickly the distribution of ringed seals might change in some regions. This reviewer expressed the opinion that it is likely to be highly variable, making conclusions about climate change impacts over broad geographic regions difficult.

*Response:* NMFS agrees that drawing such conclusions is difficult. The BRT members' assessments of the significance of specific threats to ringed seal persistence in the foreseeable future were summarized in the status review report in numerical scores. The BRT members assigned relatively low threat

scores and low degrees of certainty to threats from changes in prey availability or density and higher threat scores to changes in snow cover and the impacts on rearing young (Table 5; Kelly *et al.,* 2010a). It is not clear how increased food would compensate for the loss of snow, nor is it clear that forage fish moving north would not be accompanied by predators that would compete with ringed seals for those prey.

*Comment 21:* A peer reviewer suggested that the lack of subnivean lairs in the Sea of Okhotsk has apparently not increased pup mortality there to an extent that it has significantly decreased the population.

*Response:* Russian literature has been inconsistent as to whether or not lairs are or were used in the Sea of Okhotsk. We know of no data that would support the reviewer's assertion that pup mortality has not increased or that the population has not significantly decreased. The best available information would suggest the population has decreased, but as noted elsewhere, estimates of population size are poor.

*Comment 22:* Two peer reviewers commented that Arctic ringed seals are considerably more abundant and broadly distributed than Okhotsk and Baltic ringed seals, and their habitat is forecast to change less substantially. Therefore, it is unclear why the demographic risks for all three populations were assessed at relatively similar levels.

*Response:* The ''relatively similar levels'' are, in part, a function of the 1 to 5 numeric scale used to estimate risk in the status review report. The BRT assessed the risk in terms of abundance for the Okhotsk population as 31 percent higher than for the Arctic population, and the risk for the Baltic population as 38 percent higher than for the Arctic population in the foreseeable future (Table 10; Kelly *et al.,* 2010a). The assessment of demographic risks was detailed for each population in section 4.3 of the status review report.

*Comment 23:* A peer reviewer commented that while it is acknowledged that ringed seals have likely responded to previous warm periods, no attempt is made to explore the extent of these warming periods and how ringed seals may have adapted to them. The State of Alaska and another commenter similarly suggested that past warming periods were not adequately considered. They stated that the survival of ringed seals during interglacial periods can be considered better evidence for population persistence than predictive models of ice condition for species extinction, and that this is a primary reason why listing of ringed seals as threatened is not warranted. Greenland's DFHA expressed a similar view.

*Response:* We are not aware of any available information on ringed seal adaptive responses during the interglacial periods. A fundamental difficulty in using pre-historic warm periods as analogs for the current climate disruption is that the rate of warming in the pre-historic periods is poorly known. The species' resilience to those previous warming events, which may have been slower than the current warming, does not necessarily translate into present-day resilience. Moreover, there may be cumulative effects from climate warming and ocean acidification, or other human impacts, that combine to limit the species' resilience to the changes anticipated in the coming decades.

*Comment 24:* A peer reviewer commented that the magnitude of the impact that increased predation might have relative to mortalities associated with other climate related factors like an early spring rain or an early break-up in a particular region is not discussed. This reviewer also commented that how the suite of predators in a particular range might change from predominantly ''on-ice'' species (*e.g.,* polar bears) to ''in-water'' species (*e.g.,* sharks and killer whales) and what impacts that might have is not addressed.

*Response:* Although the relative impacts of the various factors cited by the reviewer are no doubt significant to the eventual status of ringed seals in various portions of their range, we consider them too speculative to evaluate at this time. The reviewer did not provide additional data or evidence on which to base such an evaluation.

*Comment 25:* A peer reviewer expressed the opinion that the threat posed to Arctic ringed seals by polar bear predation should be qualified. This reviewer commented that it is unlikely polar bear predation would cause significant pup mortality across the entire range of the Arctic ringed seal. In addition, this reviewer noted that it is assumed that polar bear abundance will remain high as snow conditions deteriorate; however, it is expected that polar bear populations will decline, which could reduce predator effects on ringed seals. In addition, this reviewer commented that ringed seals may also become less accessible to polar bears as seasonal sea ice decreases. Greenland's DFHA similarly discussed the dynamic relationship between polar bears and ringed seals, suggesting that observations of ringed seal declines from increased polar bear predation during ice reductions are part of the normal predator-prey cycle and should not be over-interpreted in considering potential impacts of projected changes in sea ice habitat.

*Response:* ''Significant pup mortality'' from polar bear predation would not have to occur ''across the entire range of the Arctic ringed seal'' to pose a threat. We recognize that expected declines in polar bear populations could lessen predation on ringed seals; however, decreased snow cover has also been shown to markedly increase predation success by polar bears (Kumlien, 1879; Lydersen *et al.,* 1987; Lydersen and Smith, 1989; Hammill and Smith, 1989; Hammill and Smith, 1991; Smith et *al.,* 1991; Smith and Lydersen, 1991). While decreased sea ice might decrease accessibility of seals to bears, it also may be that the decreased extent of ice could concentrate ringed seals, resulting in the opposite effect. The possible decreases in predation are speculative, while increases in predation associated with decreased snow cover have been well documented. Therefore, the best scientific and commercial data available show that the threat posed to ringed seals by predation is currently moderate, but this threat can be expected to increase as snow and sea ice conditions change with a warming climate.

*Comment 26:* A peer reviewer found the assessment of subsistence harvest in the proposed rule reasonable, noting that harvest appears to be substantial in some areas of the Arctic, but appears to remain sustainable. This reviewer commented that the ISC has been developing a harvest monitoring program with personnel assistance from the State of Alaska. The Marine Mammal Commission also commented that it does not believe that the subsistence harvest of ringed seals in U.S. waters constitutes a significant risk factor for Arctic ringed seals, and several other commenters expressed similar views regarding subsistence harvest in U.S. waters, as well as elsewhere. In contrast, another commenter expressed concern that the impact of Native subsistence hunting on ringed seals is substantially underestimated. The commenter expressed the view that NMFS needs to obtain reliable estimates of subsistence harvest of ringed seals such that their conservation status can be more closely monitored, in particular considering climate change is expected to have impacts on ringed seals and those could be exacerbated by other factors such as harvest. This commenter also suggested that additional resources should be

devoted to obtaining these estimates of subsistence harvest, and suggested that NMFS institute a harvest monitoring system rather than rely on self-reporting.

A number of commenters, including the ISC and Greenland's DFHA, emphasized that ice seals have been a vital subsistence species for indigenous people in the Arctic and remain a fundamental resource for many northern coastal communities. Some commenters, including the ISC, requested that NMFS identify what additional measures would be required before the subsistence hunt could be affected by Federal management of ringed seals and under what conditions the agency would consider taking those additional measures, and this information should be provided to residents of all potentially affected communities.

*Response:* We recognize the importance of Arctic ringed seals to Alaska Native coastal communities. Section 101(b) of the MMPA provides an exemption that allows Alaska Natives to take ringed seals for subsistence purposes as long as the take is not accomplished in a wasteful manner. Section (10)(e) of the ESA also provides an exemption from its prohibitions on the taking of endangered or threatened species by Alaska Natives for subsistence purposes, provided that such taking is not accomplished in a wasteful manner. Although the number of ringed seals harvested annually by Alaska Natives is not precisely known or comprehensively monitored, ongoing hunter surveys in several communities give no indication that the harvest numbers are excessive or have a significant impact on the dynamics of the populations (Quakenbush *et al.,* 2011). The numbers of seals harvested have likely declined substantially in recent decades because the need for food to supply sled-dog teams has diminished as snowmobiles have been adopted as the primary means of winter transport. The proportion of Alaska Natives that make substantial use of marine mammals for subsistence may also have declined due to increased availability and use of non-traditional foods in coastal communities. However, there may also be a counterbalancing increase in awareness of health benefits of traditional foods compared with non-traditional alternatives.

Under the MMPA the Alaska stock of ringed seals will be considered ''depleted'' on the effective date of this listing. In the future, if NMFS expressly concludes that harvest of ringed seals by Alaska Natives is materially and negatively affecting the species, NMFS may regulate such harvests pursuant to sections 101(b) and 103(d) of the MMPA. NMFS would have to hold an administrative hearing on the record for such proposed regulations. Currently, based on the best available data, the subsistence harvest of ringed seals by Alaska Natives appears sustainable. If the current situation changes, NMFS will work under co-management with the ISC (under section 119 of the MMPA) to find the best approach to ensure that sustainable subsistence harvest of these seals by Alaska Natives can continue into the future. NMFS is also continuing to work with the ISC to develop and expand collaborative harvest monitoring methods.

*Comment 27:* A peer reviewer commented that it is suggested that climate change will likely alter patterns of subsistence harvest of marine mammals by hunting communities. However, this reviewer noted that hunter questionnaire data from five Alaska villages (Quakenbush *et al.,* 2011) did not indicate decreases in ringed seal availability at any location.

*Response:* The alterations to subsistence harvest patterns by climate change suggested in the proposed rule are likely to occur at some unspecified time in the future, when changes to snow and ice cover are predicted to be more pronounced that they are at present. The hunter questionnaire data relate to recent, not future, ringed seal availability.

*Comment 28:* A peer reviewer commented that no information from the subsistence community or the ISC is considered in the status review report. This reviewer noted that subsistence hunters know a great deal about the biology, ecology, behavior, and movement of ringed seals, and keep a close watch for changes in the seals relative to environmental change. Several related public comments, including from the ISC, expressed the opinion that NMFS has not made adequate use of the traditional ecological knowledge (TEK) of Alaska Natives related to ice seals in the listing process. The ISC also suggested that NMFS should conduct a TEK study related to ice seals. Another commenter specifically suggested that TEK should be sought and incorporated into model projections of future snow cover on sea ice; and that the adaptive capacity of Arctic ringed seals should be further investigated by seeking observations of Native communities, especially those in the southern part of its range. This commenter also suggested that NMFS should use an empirical static modeling approach (Guisan and Zimmerman, 2000) to defensibly derive habitat parameters and use TEK to provide presence/absence data for model fitting and evaluation.

*Response:* The contribution of TEK to the overall understanding of ice-associated seal species is greater than commonly acknowledged. Much of our basic understanding of the natural history of ice-associated seals stems from information imparted by indigenous Arctic hunters and observers to the authors who first documented the biology of the species in the scientific literature. NMFS recognizes that Alaska Native subsistence hunting communities hold much more information that is potentially relevant and useful for assessing the conservation status of ice seals. Productive exchanges of TEK and scientific knowledge between the agency and Alaska Native communities can take many forms. Collaborative research projects, for example, provide opportunities for scientists and hunters to bring together the most effective ideas and techniques from both approaches to gather new information and resolve conservation issues. NMFS supports efforts to expand reciprocal knowledge-sharing, which can be facilitated through our co-management agreements. These efforts require time to build networks of relationships with community members, and the ESA does not allow us to defer a listing decision in order to collect additional information.

*Comment 29:* Four peer reviewers expressed the view that while the best scientific data available was evaluated in assessing the status of the Arctic ringed seal, this information does not provide an adequate basis to support the listing proposal for this subspecies. Two of these reviewers noted that Arctic ringed seals number in the millions, are widely distributed across a vast area and variety of habitats, and have a high degree of genetic diversity. They expressed the view that they are thus unlikely to be at high risk of major declines due to environmental perturbations including catastrophic events, and as such, they are not at risk of extinction now or in the foreseeable future, and should not be listed as threatened. In addition, these reviewers pointed out that the climate model projections suggest there will be sufficient snow and ice to support survival and reproduction of Arctic ringed seals through mid-century, and they appear to have healthy abundant populations across their range. One of these reviewers suggested that this was the case for the other subspecies as well, and noted that there is therefore still

time to monitor the status of these populations and their responses to changes in ice and snow conditions before any of the demographic characteristics considered could be expected to be at any elevated risk level.

In opposing the proposed listing of Arctic ringed seals, several related public comments, including from the State of Alaska, Canada's DFO, Nunavut's Department of Conservation, and Greenland's DFHA, similarly noted that Arctic ringed seals appear to have healthy abundant populations across their range. Several commenters suggested that the ESA is not intended to list currently healthy abundant species that occupy their entire historical ranges. Some of these commenters expressed the opinion that if NMFS lists healthy abundant species under the ESA based on assessments that consider the potential biological consequences of multi-decadal climate forecasts, virtually every species could be considered threatened. A few commenters also stated that a conclusion that the Arctic ringed seal subspecies will decline from millions of seals to being threatened with extinction should be accompanied with some level of quantification regarding what constitutes being in danger of extinction. Finally, the State of Alaska commented that although the monitoring could be enhanced, ADFG's Arctic Marine Mammal Program is adequate to detect landscape population level patterns and problems, should they arise in the future.

*Response:* The ESA defines a threatened species as one that ''is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range'' (16 U.S.C. 1532(20)). Whether a species is healthy at the time of listing or beginning to decline is not the deciding factor. The inquiry requires NMFS to consider the status of the species both in the present and through the foreseeable future. Having received a petition and subsequently having found that the petition presented substantial information indicating that listing ringed seals may be warranted (73 FR 51615; September 4, 2008), we are required to use the best scientific and commercial data available to determine whether ringed seals satisfy the definition of an endangered or threatened species because of any of the five factors identified under section 4(a)(1) of the ESA. These data were compiled in the status review report of the ringed seal (Kelly *et al.,* 2010a) and summarized in the preamble to the proposed rule.

We agree that Arctic ringed seals are currently thought to be distributed throughout their range and number in the millions, are widely distributed and genetically diverse, and are not presently in danger of extinction. However, these characteristics do not protect them from becoming at risk of extinction in the foreseeable future as a consequence of widespread habitat loss. Based on the best available scientific data, we have concluded that the persistence of Arctic ringed seals likely will be challenged as decreases in ice and, especially, snow cover lead to increased juvenile mortality from premature weaning, hypothermia, and predation. Initially impacts may be somewhat ameliorated as the subspecies' range retracts northward with sea ice habitat. By the end of this century, however, average snow depths are projected to be less than the minimum depths needed for successful formation and maintenance of birth lairs throughout a substantial portion of the subspecies' range. Thus, within the foreseeable future it is likely that the number of Arctic ringed seals will decline substantially, and they will no longer persist in substantial portions of their range.

Data were not available to make statistically rigorous inferences how Arctic ringed seals will respond to habitat loss over time. We note that we currently have no mechanism to detect even major changes in ringed seal population size (Taylor *et al.,* 2007). However, the BRT's assessment of the severity of the demographic risks posed to the persistence of each of the ringed seal subspecies was formalized using a numerical scoring system. The BRT judged the risks to Arctic ringed seal persistence to be moderate to high within the foreseeable future (Table 10; Kelly *et al.,* 2010a). After considering these risks as well as the remaining factors from section 4(a)(1) of the ESA, we concluded that the Arctic ringed seal is likely to become endangered within the foreseeable future (threatened), primarily due to the projected loss of sea ice habitat, in particular snow cover.

*Comment 30:* A peer reviewer commented that although Baltic and Ladoga ringed seals are the most at risk due to their lower abundances and limited habitat, there do not appear to be sufficient data available to evaluate the risks to their persistence. Similarly, several commenters expressed the view that there are insufficient data, including on abundance and population trends, to proceed with the listing of Arctic ringed seals at this time. Some commenters stated that we should defer the listing decision for the Arctic ringed seal in particular until more information becomes available. Two commenters specifically noted that NMFS has announced that it is conducting large-scale ice seal aerial surveys, and they requested that NMFS delay the listing determination until the results of these surveys become available.

*Response:* Under the ESA, we must base each listing decision on the best available scientific and commercial data available after conducting a review of the status of the species and taking into account any efforts being made by states or foreign governments to protect the species, and we have done so in assessing the status of Arctic, Okhotsk, Baltic, and Ladoga ringed seals. These data were summarized in the preamble to the proposed rule and are discussed in detail in the status review report (see Kelly *et al.,* 2010a). The existing body of literature concerning ringed seal population status and trends is limited, and additional studies are needed to better understand many aspects of ringed seal population dynamics and habitat relationships. However, the ESA does not allow us to defer listing decisions until additional information becomes available. In reaching a final listing determination we have considered the best scientific and commercial data available, including the information provided in the status review report as well as information received via the peer review process and public comment. These data are sufficient to conclude that Arctic, Okhotsk, and Baltic ringed seals are likely to become endangered within the foreseeable future (threatened) and Ladoga ringed seals are in danger of extinction (endangered).

*Comments on the Climate Model Projections and the Identification and Consideration of Related Habitat Threats*

*Comment 31:* A commenter noted that studies indicate the risks from climate change are substantially greater than those assessed in the IPCC's AR4, raising concern that the IPCC climate change projections used in the status review report likely underestimate climate change risks to ringed seals.

*Response:* Although recent observations of annual minimum ice extent in the Arctic Ocean have been outside (*i.e.,* below) the majority of model runs projected from the most commonly used scenarios, a few models exhibit anomalies of a similar magnitude early in the 21st century. Nonetheless, the observed sea ice retreat has been faster than the consensus projection, which may have occurred either because: (1) climate models do

not have sufficient sea ice sensitivity to the rise in GHG forcing, or (2) there is an unusually large contribution in observations from natural variability. Many of the same recent years have been characterized by near record high ice extents in regions such as the Bering Sea, for example. While we recognize the possibility that consensus projections may underestimate the future risks to ringed seals, the likelihood of that does not seem to be sufficiently established to warrant abandonment of the IPCC AR4 as the best available scientific basis for projection of future conditions.

*Comment 32:* The State of Alaska noted that predicting climate change is made more difficult and uncertain by decades long shifts in temperature that occur due to such variables as the Pacific Decadal Oscillation (PDO).

*Response:* Climate models account for PDO variability but the PDO is chaotic—the future points at which it will shift between its warm and cool phases cannot currently be predicted. In this sense, a specific PDO is not predictable in the future. To address this unpredictable variability, NMFS used the average from an ensemble of models and model runs. The average of the ensemble indicates the expected response forced by rising GHGs and aerosol changes. The individual model runs that compose the ensemble vary substantially, often trending above or below the average, or bouncing back and forth across it. The variability among the model runs in the ensemble reflects the unpredictability of the PDO and many other factors. We used the range of this variability in our projections of future ice conditions, for example, to characterize the minimum, mean, and maximum ice concentrations in future decades.

*Comment 33:* The State of Alaska and another commenter noted that it is assumed Arctic ringed seals cannot survive without year-round ice. However, they suggested that the current status of the other ringed seal subspecies indicates ringed seals can survive without multi-year ice.

*Response:* Our risk assessment for Arctic ringed seals was not based on an assumption that they require sea ice year-round. The threats that were scored by the BRT as moderate to high significance were a decrease in sea ice habitat suitable for whelping and nursing, and increased hypothermia due to insufficient depth or duration of snow cover (Table 5; Kelly *et al.,* 2010a). Both of these threats are relevant to the period of whelping and pup rearing, about mid-March to mid-June for Arctic ringed seals. We discussed in the preamble to the proposed rule that the projected decreases in sea ice, and especially snow cover, are expected to lead to increased pup mortality from premature weaning, hypothermia, and predation.

*Comment 34:* A commenter expressed the view that sea ice in the Arctic has been in decline for a number of years without observed detrimental effects on ringed seals, thus calling into question NMFS's assumption that future declines in sea ice will inevitably result in impacts to ringed seals.

*Response:* As noted in the preamble to the proposed rule and discussed in detail in the status review report, our present ability to detect changes in the Arctic and Okhotsk ringed seal populations is limited. There are no population estimates sufficiently precise for use as a reference in judging trends. Indices of condition, such as those recently reported by ADFG (Quakenbush *et al,* 2011), are available for only a limited portion of the Arctic ringed seal's range and would not be expected to detect certain types of detrimental effects, such as an increase in pup mortality by predation. Therefore, while NMFS is not aware of unequivocal evidence that Arctic or Okhotsk ringed seals have declined, the converse is equally true: there is no firm evidence that these populations are stable or increasing. Our decision to list these subspecies is based primarily on our conclusion for ESA listing Factor A that ongoing and projected changes in sea ice habitat pose significant threats to the persistence of all of the ringed seal subspecies.

The primary concern about future ringed seal habitat stems from projections of inadequate snow depths for birth lair formation and maintenance later in the 21st century. Although the model projections considered in the status review report indicate a decline in snow depth on sea ice has been underway for some years, the average predicted depth remains at least slightly greater than the 20 cm minimum for lairs. Thus, these projections are consistent with a scenario in which little or no impact from climate disruption has yet been felt by Arctic ringed seals. The anticipated impacts likely will begin to appear in the near future as average snow depth on ice declines.

*Comment 35:* The State of Alaska and another commenter suggested that the record high winter ice in the Bering Sea from 2007–2010 casts some doubt on the determination of the threat of extinction to ringed seals. They noted that the climate model projections make it clear that winter ice will continue to occur, and that the length of open water and changes in snow accumulation are the primary issues. These commenters expressed the view that changes in the distribution and numbers of ringed seals may occur, but the continued occurrence of winter ice, and particularly years where its record extent coincides with low summer ice, indicate that a more thorough assessment of seal habitat and population responses is needed before the threat of extinction can be assessed with any level of certainty.

*Response:* The above average ice cover in winter in the Bering Sea in 4 of the last 5 years is consistent with natural variability of the past 33 years and does not represent a statistically significant increase. In any case, as the reviewer notes, the length of the open water season and snow depths are the primary issues. Furthermore it is the trend, forced from rising GHGs, in the sea ice cover in fall (and hence open water) that causes snow depth to decline in the model projections.

*Comment 36:* A commenter noted that NMFS's current MMPA stock assessment report and proposed draft update state that there are insufficient data to predict the effects of Arctic climate change on the Alaska ringed seal stock, suggesting that predicting future population declines based upon climate change effects is speculative.

*Response:* NMFS's MMPA stock assessments for ice-associated seals need to be updated, which NMFS is in the process of doing to reflect new data and recent analyses from ESA status reviews.

*Comment 37:* A commenter noted that elders and hunters interviewed in 2011 for a Kawerak research project on TEK of ice seals and walruses reported changes in ice and weather that complicated hunter access, but they also explained that walrus, bearded, and ringed seals were as healthy as ever. The commenter also noted that multiple hunters in these interviews also reported that marine mammals have shifted their migrations to match the timing of earlier ice break-ups. Individual observations regarding ice seal ecology, health, abundance, behavior, and habitat were also provided by a number of coastal Alaska residents, primarily Native hunters. Many of these comments, including those from the ISC, indicated that although the effects of a warming Arctic have been observed for a number of years, ringed seals appear healthy and abundant, and any significant decline does not appear to be sufficiently imminent to warrant listing Arctic

ringed seals as threatened under the ESA at this time.

*Response:* TEK provides a relevant and important source of information on the ecology of Arctic ringed seals, and we have carefully reviewed the comments submitted from individuals with TEK on ringed seals and climate change. We do not find that these observations conflict with our conclusions. As we have noted in response to other related comments, Arctic ringed seals are not presently in danger of extinction, but are likely to become endangered within the foreseeable future.

*Comment 38:* Greenland's DFHA commented that the most pessimistic scenarios for consequences of sea ice loss on polar bears estimate a reduction in the polar bear population to one-third of its present size by 2099, and that if the densities of polar bears and Arctic ringed seals continue to stay correlated in the ratio of 1:200, this implies that there would still be more than 2 million ringed seals.

*Response:* The ratio between ringed seal and polar bear densities, and the speculation that such a ratio would remain constant in the face of extreme changes in the Arctic ecosystem, are interesting as a conceptual exercise but cannot be considered the best scientific and commercial information for the purpose of our ESA listing decision.

*Comment 39:* Greenland's DFHA suggested that if the projected changes in sea ice cover are realized, ringed seal habitat will likely shift northward of the range of Inuit hunters. They commented that in recent years new ringed seal habitat has emerged in northern areas where there is not hunting, which has actually created a new sanctuary for ringed seals in what must be some of the most pristine habitats on earth.

*Response:* The current levels of subsistence hunting do not threaten ringed seal populations. If sanctuaries from human or other predation were to emerge, as the commenter suggested, this could moderate, to some extent, losses due to poor snow and ice conditions. However, given the relatively small impact of hunting, and the potentially very large impact from the loss of pupping habitat, such sanctuaries would have limited benefit for the declining population status over time.

*Comment 40:* Some commenters argued that ocean acidification should be determined to be a significant threat, in particular when considered cumulatively with other climate change impacts. Another commenter disagreed, and felt that NMFS more clearly discussed the uncertainties associated with assessing the potential impacts of ocean acidification in the previous ESA listing determinations for ribbon and spotted seals.

*Response:* As we discussed in the preamble to the proposed rule, the impact of ocean acidification on ringed seals is expected to be primarily through changes in community composition, but the nature and timing of these changes is uncertain. The BRT members tended to rank the threat from ocean acidification as relatively low, but also noted the very low degree of certainty about the nature and magnitude of potential effects on ringed seals (Tables 5–8; Kelly *et al.,* 2010a). However, the BRT did consider cumulative effects as part of the threats assessment scoring procedure, as evidenced by the fact that the overall score for each ESA section 4(a)(1) factor tended to be as high or higher than the score assigned for individual threats within each factor.

*Comments on the Identification and Consideration of Other Threats*

*Comment 41:* A commenter expressed the opinion that the listing of ringed seals is related to the elevated number of sick or dead ringed seals reported in 2011. This commenter noted, however, that testing has not identified a cause for this apparent disease outbreak, and that the significance of the mortalities to the population as a whole is unclear.

*Response:* The proposed listing of Arctic ringed seals is not related to the disease outbreak referred to by the commenter, which began after the proposal was published. The elevated numbers of sick or dead ringed seals in the Arctic and Bering Strait regions of Alaska beginning in July 2011 led to the declaration of an unusual mortality event (UME) by NMFS under the MMPA on December 20, 2011. The underlying cause of this UME is unknown and remains under focused expert investigation. We acknowledged in the preamble to the proposed rule that abiotic and biotic changes to ringed seal habitat could lead to exposure to new pathogens or new levels of virulence. However, based on the best scientific and commercial data available, we continue to consider the potential threats to ringed seals from disease to be low.

*Comment 42:* A few commenters expressed the opinion that existing regulatory mechanisms in the United States and elsewhere are not adequate to address the factors driving climate disruption (*i.e.,* GHGs). One of these commenters suggested that U.S. agencies are either failing to implement or only partially implementing laws for GHGs, and that the continued failure of the U.S. Government and international community to implement effective and comprehensive GHG reduction measures places ringed seals at ever-increasing risk, where the worst-case IPCC scenarios are becoming more likely.

*Response:* While some progress is being made in addressing anthropogenic GHG emissions, we recognize in our analysis under ESA listing Factor D that current mechanisms do not effectively regulate the anthropogenic processes influencing global climate change and the associated changes to ringed seal habitat, and that this is contributing to the risks posed to ringed seals by these emissions. Further, we note that our analysis considered future emissions scenarios that did not involve dramatic and substantial reductions in GHG emissions.

*Comment 43:* Some commenters suggested that NMFS should re-examine its conclusion that fisheries do not threaten ringed seals because a warming climate could lead to shifts in commercial fisheries that could affect the seal's food base.

*Response:* The possible advent of new commercial fisheries, and the nature and magnitude of ecosystem responses, are speculative. Although there are possible risks, those should be mitigated through appropriate management of new fisheries. In U.S. waters, the intent to conduct such responsible management is evident in the *Arctic Fishery Management Plan* (North Pacific Fishery Management Council, 2009), which establishes a framework for sustainably managing Arctic marine resources.

*Comment 44:* Some commenters stated that offshore oil and gas development should be determined to be a threat to ringed seals in part because there is no technology available to effectively contain or recover spilled oil in ice covered waters, and a large oil spill could be devastating to these seals. In addition one of these commenters emphasized that extensive offshore oil developments are currently underway within the range of Arctic ringed seals, and additional drilling is proposed in the Beaufort and Chukchi seas. Other commenters stated that offshore oil and gas development, as currently regulated, does not pose a significant threat to Arctic ringed seals.

*Response:* Although a large oil spill could cause substantial injury, mortality, and indirect impacts to seals in the area, the risks posed to persistence of the ringed seal subspecies as a whole are low and are possible to mitigate by preventive measures, at least relative to the much more pervasive

risks from climate change and habitat loss.

*Comments on the Status Determinations for the Ringed Seal Subspecies*

*Comment 45:* The State of Alaska, Canada's DFO, Nunavut's Department of Environment, and several other commenters expressed the opinion that Arctic ringed seals should not be listed because there are no scientific data demonstrating any observed past or present adverse impacts on ringed seal populations resulting from sea ice recession or other environmental changes attributed to climate change. The State of Alaska also extended this comment to the other subspecies of ringed seals proposed for listing. These commenters suggested that the determinations rely on the results of predictive models and speculation about future impacts, which they argued provide insufficient justification. Some of these commenters noted that in contrast, the polar bear ESA determination relied upon data for some populations that suggested a link between observed population declines or other population vital rates and climate change. Further, the State of Alaska and another commenter suggested that climate model projections should be considered as hypotheses to be tested with data collected over time.

*Response:* We have concluded that the best scientific and commercial data available, which are discussed in detail in the status review report and are summarized in this notice, provide sufficient evidence that: (1) Ringed seals are strongly ice-associated and the pupping and nursing seasons, in particular, are adapted to the phenology of ice and snow; (2) reductions in sea ice and in particular the depth and duration of snow cover on sea ice are very likely to occur within the foreseeable future; (3) without the protection of lairs, ringed seals, in particular newborn pups, are vulnerable to freezing and predation; (4) the rates of environmental change will be rapid in the coming centuries and may outpace possible adaptive responses; and (5) the rapid changes in sea ice habitat are likely to decrease the ringed seal populations to levels where they are in danger of extinction. Because Arctic ringed seals stay with the ice as it annually advances and retreats, the southern edge of this subspecies' range may initially shift northward. However, whether Arctic ringed seals will continue to move north with retreating ice over the deeper, less productive Arctic Basin waters and whether species that they prey on will also move north is uncertain. Land boundaries will limit the ability of Okhotsk, Baltic, and Ladoga ringed seals to shift their range northward in response to deteriorating ice and snow conditions. Regarding the climate model forecasts, the BRT analyses used simulations from six CMIP Phase 3 (CMIP3) models prepared for the IPCC's AR4, which represent the scientific consensus view on the causes and future of climate change and constitute the best scientific and commercial data available. Based on this information, and after considering the five ESA section 4(a)(1) factors, we have determined that the Arctic, Okhotsk, and Baltic subspecies are likely to become endangered within the foreseeable future throughout their ranges (*i.e.,* threatened under the ESA). Ladoga ringed seals are also faced with additional threats and the population has been greatly reduced from historical numbers. We have therefore determined that an endangered listing is appropriate for this subspecies.

With regard to the comment that the climate model projections should be considered as hypotheses, with data collected over time to test the hypotheses, taking that approach in lieu of listing is not an option under the ESA. If the best scientific and commercial data available indicate that a species satisfies the definition of threatened or endangered, then NMFS must list it. In time, as new data become available, NMFS may de-list a species, change its listing status, or maintain its listing status. The determination here is based on the best scientific and commercial data that is presently available.

*Comment 46:* The Marine Mammal Commission recommended that before listing the Arctic ringed seal subspecies, NMFS first determine whether ringed seals in the Canadian Arctic Archipelago might be recognized as a discrete and significant population and excluded from the listing due to limited change in physical and ecological conditions projected for that area. A related comment from Canada's DFO expressed the view that the subspecies-wide listing of Arctic ringed seals does not address the variable spatial and temporal scales of threats that the different populations of Arctic ringed seals face. This commenter noted, for example, that while in the southern parts of its range certain Arctic ringed seal populations might be compromised if warming trends continue, in other Arctic regions ringed seal habitat could be expected to remain.

*Response:* Under our ''Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act'' (61 FR 4722; February 7, 1996) two elements are considered when evaluating whether a population segment qualifies as a distinct population segment (DPS) under the ESA: (1) The discreteness of the population segment in relation to the remainder of the species or subspecies to which it belongs; and (2) the significance of the population segment to the species or subspecies to which it belongs. If a population segment is discrete and significant (*i.e.,* it is a DPS), its evaluation for endangered or threatened status will be based on the ESA's definitions of those terms and a review of the factors enumerated in section 4(a).

A population segment of a vertebrate species may be considered discrete if it satisfies either one of the following conditions: (1) it is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors; or (2) it is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the ESA. As summarized in the preamble to the proposed rule and discussed in detail in the status review report (p. 35–39), we found no evidence of discrete segments within the Arctic ringed seal population, including within the Canadian Arctic Archipelago. Therefore, we did not take the next step of determining whether any population segment is significant to the taxon to which it belongs.

*Comment 47:* A commenter suggested that if NMFS determines that any of the ringed seal subspecies are threatened under the ESA, it should adopt the approach used by FWS for species such as the walrus and designate them as candidate species, or alternatively list them as species of concern. This commenter expressed the opinion that listing the species as candidate species or species of concern would avoid unnecessary expenditure of resources while providing for the option to take appropriate action under the ESA if it becomes necessary.

*Response:* Although NMFS and FWS define candidate species the same way in their joint regulations, the two agencies have slightly different interpretations of the term. FWS candidate species are those species for which FWS has sufficient information to support an ESA listing but for which issuance of a proposed rule is precluded due to higher priority listings (61 FR 64481; December 5, 1996). Therefore,

FWS has already determined that its candidate species warrant listing under the ESA. In contrast, NMFS uses the term ''candidate species'' to refer to ''(1) species that are the subject of a petition to list and for which NMFS has determined that listing may be warranted, pursuant to section 4(b)(3)(A), and (2) species for which NMFS has determined, following a status review, that listing is warranted (whether or not they are the subject of a petition)'' (69 FR 19976; April 15, 2004). Regardless, once a species has been proposed for listing, section 4(b)(6)(A) of the ESA does not allow us to issue a ''warranted but precluded'' finding. Such a finding is only permissible at the time of a 12-month finding (see section 4(b)(3)(B)), not a final rule. NMFS defines a ''species of concern'' as a species that is not being actively considered for listing under the ESA, but for which significant concerns or uncertainties regarding its biological status and/or threats exist (69 FR 19975; April 15, 2004). This is not the case for Arctic, Okhotsk, Baltic, or Ladoga ringed seals.

*Comment 48:* A commenter noted that the Alaska stock of ringed seals is not listed as depleted or strategic under the MMPA by NMFS, which they suggested indicates the absence of scientific data or consensus that these populations are currently threatened or in significant decline.

*Response:* The absence of a depleted designation does not mean that a species is not threatened under the ESA. Similarly, the absence of a threatened designation does not mean a species or population stock is not depleted under the MMPA. Under both the ESA and the MMPA, these determinations are based on reviews of the best scientific and commercial data available, which is the process NMFS is undertaking here.

The criteria for depleted or strategic status under the MMPA also differ from those for threatened or endangered species under the ESA. A species or population stock is considered depleted under the MMPA if it is determined through rulemaking to be below its optimum sustainable population (OSP) or if it is listed as threatened or endangered under the ESA. Section 3(9) of the MMPA (16 U.S.C. 1362(9)) defines OSP as ''the number of animals which will result in the maximum productivity of the population or species, keeping in mind the carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element.'' Under the MMPA, the term ''strategic stock'' means a marine mammal stock: (1) for which the level of human-caused mortality exceeds the maximum number of animals that may be removed (not including natural mortalities) while allowing the stock to reach or maintain its OSP; (2) based on the best available scientific information, is declining and likely to be listed as threatened under the ESA; or (3) is listed as threatened or endangered under the ESA. While we may consider MMPA stock assessment information, our determination as to whether the Arctic ringed seal meets the definition of a threatened or endangered species must be based on an assessment of the threats according to section 4 of the ESA.

*Comment 49:* Several commenters, including Canada's DFO and Nunavut's Department of Environment, expressed the view that listing the ringed seal subspecies as threatened is inconsistent with the IUCN's listing of ringed seals among species of ''least concern.''

*Response:* While we may review the assessment processes and conclusions of other expert organizations such as the IUCN, our determination as to whether the ringed seal subspecies meet the definition of threatened or endangered must be an independent one based on an assessment of the threats according to section 4 of the ESA. After reviewing the best scientific and commercial data available, we have determined that Arctic, Okhotsk, and Baltic, ringed seals are likely to become endangered within the foreseeable future (threatened) and that Ladoga ringed seals are in danger of extinction (endangered).

*Comment 50:* The Marine Mammal Commission recommended that NMFS re-evaluate individual and cumulative threats to the Baltic and Ladoga subspecies of ringed seals and consider listing these species as endangered. The Commission noted that the Baltic and Ladoga subspecies are greatly reduced from historical numbers and are subject to a range of threats in addition to reduction in ice habitat, including mortality in fishing gear, industrial pollution, and for Ladoga ringed seals, disturbance of summer haul-out site areas, and likely increased risk of predation as lair conditions deteriorate.

*Response:* With regard to Baltic ringed seals, we expressly recognized the threats identified by the Commission in the preamble to the propose rule. The BRT judged the risks posed by those threats to be low to moderate at present. In weighing the immediacy and magnitude of the threats posed to Baltic ringed seals, we continue to conclude that Baltic ringed seals are likely to become endangered within the foreseeable future, rather than that they are in danger of extinction.

We have also considered the Commission's comments and information regarding Ladoga ringed seals. After reanalyzing the factors affecting Ladoga ringed seals, we agree that greater weight should be given to the range of threats affecting these seals, and in particular the severity of the threats posed by loss of ice and snow and mortality in fishing gear. As noted in the preamble to the proposed rule, threats such as drowning of seals in fishing gear and disturbance from human activities are conservation concerns for Ladoga ringed seals that could exacerbate the effects to these seals due to climate change and habitat loss. There is evidence that seal-fisheries conflicts continue, and that bycatch of seals in fishing nets is a significant source of mortality (Verevkin *et al.,* 2010). Medvedev and Sipilä (2010) also reported that in the north portion of Lake Ladoga there has been a marked decrease in snow cover and thickness of snow drifts. They noted that the importance of this northern part of the lake as breeding habitat is likely to increase as ice cover decreases or disappears in southern Lake Ladoga. We have therefore concluded in our analysis of the five ESA section 4(a)(1) factors that the risks to Ladoga ringed seals under listing Factor A (''The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range'') and to a lesser extent Factor D (''Inadequacy of Existing Regulatory Mechanisms'') and Factor E (''Other Natural or Manmade Factors Affecting the Species' Continued Existence'') are collectively significantly contributing to the risk of extinction for this landlocked population. We note that Kovacs *et al.* (2012) cited similar threats in classifying the Ladoga ringed seal as endangered according to the IUCN Red List classification criteria. After reconsidering the ESA section 4(a)(1) factors in light of the Commission's comments and the new information discussed above, and taking into consideration other relevant factors, including conservation efforts and special designations for this population, we have determined that Ladoga ringed seals are ''in danger of extinction,'' and are now listing them as endangered in this final rule.

*Comments Related to Subsistence Harvest of Ringed Seals*

*Comment 51:* Several comments received, including from the ISC, expressed concern that Alaska Natives who harvest ice seals, and all of the coastal communities, will likely be disproportionately affected by the listing of Arctic ringed seals as

threatened; and that the listing could cause hardship in the form of restrictions being placed on subsistence hunting of the seals, and could also result in other restrictions that could impair economic development. Some of these commenters expressed concern that the listing could also result in additional unfunded mandates, such as monitoring of the seal harvest.

*Response:* As discussed above, the MMPA and ESA exempt subsistence takes by Alaska Natives from the marine mammal take prohibitions. Subsistence harvest of ringed seals by Alaska Natives appears sustainable and does not pose a threat to the populations. If the current situation changes, we will work under the co-management agreement with the ISC to find the best approach to ensure that sustainable subsistence harvest of these seals by Alaska Natives continues. Protection under the ESA does not automatically result in specific data collection and reporting requirements for the species. However, benefits of listing a species under the ESA can include enhanced funding and research opportunities that might address aspects of the harvest for a listed species. In addition, when a species is listed under the ESA, additional protections apply that promote the conservation of the species and therefore have the potential to benefit subsistence harvests. For example, section 7 of the ESA requires Federal agencies to ensure that the activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the action agency must enter into consultation with NMFS.

*Comment 52:* The ISC expressed the view that, should Arctic ringed seals be listed under the ESA, the Alaska Native community should have a strong role in determining the terms of subsequent management, including (1) representation on the recovery team, (2) the identification of critical habitat, (3) identification of criteria that must be met before any changes could be required in the harvest of ringed seals or trade in their parts, (4) identification of research priorities, and (5) identification of a mechanism for distribution of funds available for research and management. Some other commenters similarly suggested that local Native subsistence users should be involved directly and have primary roles in any subsistence-related management or monitoring activities involving ringed seals.

*Response:* We recognize the importance of ringed seals to the Alaska Native community, as well as the expertise and particular knowledge the Alaska Native hunting communities possess regarding the species and its habitats. We are committed to meaningful involvement of stakeholders, including the Alaska Native Community, throughout any recovery planning process. Critical habitat will be proposed in subsequent rulemaking. We are soliciting comments on the identification of critical habitat (see **DATES, ADDRESSES**, and Public Comments Solicited for additional information). We encourage those with expertise and understanding of those physical or biological features which are essential to the conservation of the Arctic ringed seal and which may require special management to submit written comments.

In the response to comment 26 above, we explained the criteria that must be satisfied for any regulation of subsistence harvest of ringed seals or trade in their parts to occur under the MMPA.

We appreciate the ISC's interest in identifying research priorities and a mechanism to distribute funds for ice seal research and management. The ISC's *Ice Seal Management Plan* identifies its biological and subsistence research recommendations for ice seals. The ISC has provided this management plan to NMFS and we are taking the information into consideration in planning future research (the ISC has also made a copy of this plan available at our web site; see **ADDRESSES**).

*Comments on the ESA Process and Related Legal and Policy Issues*

*Comment 53:* NMFS received comments that we should consult directly with all of the Alaska Native communities that could potentially be affected by the proposed listings, hold public hearings in each of these communities, and consult directly with the ISC on the listings. The ISC stated that they protest the lack of consultation, request an explanation from NMFS, and require a commitment to be involved in all future aspects of the listing process prior to any future public announcement. Some commenters, including the ISC, also expressed concern that without holding hearings in more communities where a majority of the ice seal hunters live, these communities were not able to provide informed comments. In addition, one commenter stated there is confusion and frustration in the Alaska Native community regarding the listing process and harvest implications, and suggested that a better process is needed to ensure that all stakeholders have an opportunity to learn about and understand the proposed rules and their implications. We received several comments expressing concern that consultation with Alaska coastal communities and local leaders was inadequate. One commenter asserted that the Inuit of Alaska, Canada, Russia, and Greenland should all play a central consultative role in any decision that could affect them in relation to wildlife food sources and wildlife management regimes.

*Response:* NMFS has coordinated with Alaska Native communities regarding management issues related to ice seals through co-management organizations, particularly the ISC. NMFS discussed the listing petitions with the ISC, and provided updates regarding the timeline for the ringed seal status review. Following publication of the proposed listing determination, we notified the ISC of the proposal and requested comments on the proposed rule. NMFS remains committed to working with Alaska Natives on conservation and subsistence use of ringed seals.

We acknowledge the value of face-to-face meetings, and NMFS held three public meetings in: (1) Anchorage, Alaska, on March 7, 2011; (2) Barrow, Alaska, on March 22, 2011; and (3) Nome, Alaska, on April 5, 2011. The logistical difficulties with holding additional hearings in other remote communities made it impractical to do so. We instead used other methods to provide opportunities for the public to submit comments both verbally and in writing. With assistance from the North Slope and Northwest Arctic boroughs, we provided teleconferencing access to the Barrow hearing from outlying communities in the North Slope Borough and from Kotzebue. The public hearings in Anchorage and Barrow were announced in the **Federal Register** on February 22, 2011 (76 FR 9733), and the public hearing in Nome was announced in the **Federal Register** on March 18, 2011 (76 FR 14882). The communities of Kaktovik, Wainwright, Point Lay, Point Hope, Nuiqsut, Anaktuvuk Pass, and Kotzebue participated in the Barrow hearing via teleconferencing. The public hearings were attended by approximately 88 people. In response to comments received during the public comment period that indicated some tribes may wish to consult on the proposed rule, we also contacted potentially affected tribes by mail and offered them the opportunity to consult on the proposed action.

We recognize the value of ringed seals to the Inuit of Canada, Alaska, Russia, and Greenland, and we have considered

all of the comments received from interested parties in our final determination. Further, we note that E.O. 13175 outlines specific responsibilities of the Federal Government in matters affecting the interests of recognized tribes in the contiguous 48 states and in Alaska. We have met those obligations in the development of this final action.

*Comment 54:* The State of Alaska commented that NMFS did not involve the State in a meaningful manner in either the development of the status review report or the proposed listing rule.

*Response:* We sent a copy of the 90-day petition finding to ADFG and considered all of the comments and information submitted in response to this finding in the development of the status review report and the proposed rule. We also provided funding to ADFG to analyze information and samples collected from Alaska Native subsistence harvest of ringed seals to make these data available for inclusion in the status review report. Although reports on the results of this work were submitted after the status review report was completed and the proposed rule was published, we have considered this information in our final determination. During the initial public comment period, we sent a copy of the proposed rule to ADFG and the Alaska Department of Natural Resources (ADNR), and in those mailings noted the Internet availability of the proposed rule, status review report, and other related materials. In response to requests received, including from the State of Alaska, we extended the public comment period 45 days to provide additional time for submission of comments. We have thoroughly considered the comments submitted by the State of Alaska, and these comments are addressed in this final rule.

*Comment 55:* Some commenters expressed the opinion that the ESA is not intended as a means to regulate potential impacts from climate change, or that the primary potential threats to ringed seals identified are the result of a global phenomenon that cannot be effectively addressed through the ESA, and thus the proposed listings will not provide a significant conservation benefit.

*Response:* First, this rulemaking does not regulate impacts from climate change. Rather, it lists certain species as threatened or endangered, thereby establishing certain protections for them under the ESA. Second, section 4(b)(1)(A) of the ESA states that the Secretary shall make listing determinations solely on the basis of the best scientific and commercial data available after conducting a review of the status of the species and taking into account efforts to protect the species. Based on our review of the best available information on the status of Arctic, Okhotsk, Baltic, and Ladoga ringed seals, and efforts currently being made to protect these subspecies, we conclude that Arctic, Okhotsk, and Baltic ringed seals should be listed as threatened and Ladoga ringed seals should be listed as endangered. Our supporting analysis is provided in this final rule and is supplemented by our responses to peer review and public comments. While listing does not have a direct impact on the loss of sea ice or the reduction of GHGs, it may indirectly enhance national and international cooperation and coordination of conservation efforts; enhance research programs; and encourage the development of mitigation measures that could help slow population declines. In addition, the development of a recovery plan will guide efforts intended to ensure the long-term survival and eventual recovery of Arctic ringed seals.

*Comment 56:* Several commenters, including the State of Alaska and the ISC, expressed the view that ringed seals and their habitat are adequately protected by existing international agreements, conservation programs, and laws such as the MMPA.

*Response:* We recognize that there are existing regulatory mechanisms, such as the MMPA, that include protections for ringed seals. However, declining to list a species under the ESA because it is generally protected under other laws such as the MMPA would not be consistent with the ESA, which requires us to list a species based on specified factors and after considering conservation efforts being made to protect the species. As discussed in our analysis under ESA listing Factor A, a primary concern about the conservation status of the ringed seal stems from the likelihood that its sea ice habitat has been modified by the warming climate and that the scientific consensus projections are for continued and perhaps accelerated warming for the foreseeable future. While we acknowledge that there is some progress being made in addressing anthropogenic GHG emissions, we also recognize under listing Factor D that current mechanisms do not effectively regulate the anthropogenic factors that influence global climate change and the associated changes to ringed seal habitat.

*Comment 57:* The State of Alaska commented that NMFS's proposed listing of the Arctic ringed seal would interfere directly with Alaska's management of ringed seals and their habitat and would therefore harm Alaska's sovereign interests. The State also commented that NMFS's listing determination impedes Alaska's ability to implement its own laws by displacing State statutes and regulations addressing Alaska's wildlife and natural resources generally, and ringed seals specifically.

*Response:* The ESA does not preclude the State from managing ringed seals or their habitat. We disagree that the listing of a species under the ESA would displace a specific state law or otherwise impede the State's ability to implement its own laws. We note that in 2009 NMFS and ADFG entered into a cooperative agreement for the conservation of threatened and endangered species pursuant to ESA section 6(c)(1).

*Comment 58:* The State of Alaska commented that NMFS's consideration of the State's formal conservation measures designed to improve the habitat and food supply of ringed seals is extremely limited, and without any supporting analysis. Such limited consideration of the State's conservation programs fails to comply with NMFS's affirmative statutory obligation under ESA section 4(b) and NMFS's Policy for the Evaluation of Conservation Efforts.

*Response:* The ESA provides that NMFS shall make listing determinations solely on the basis of the best scientific and commercial data available and after conducting a review of the status of the species and taking into account those efforts, if any, of any state or foreign nation to protect such species. NMFS has developed a specific Policy for Evaluation of Conservation Efforts (68 FR 15100; March 28, 2003) that identifies criteria for determining whether formalized conservation efforts that have yet to be implemented or to show effectiveness contribute to making listing a species as threatened or endangered unnecessary.

The State of Alaska asserts that it has implemented laws, regulations, and mitigation measures that are generally aimed at protecting ice seals and their prey. These ''measures'' (the most relevant of which are summarized below), however, are not specifically directed toward the conservation of ringed seals and their ice habitat. For example, the mitigation measures referenced by the State aim to minimize the impact of oil and gas operations, rather than proactively or specifically to conserve the species. Moreover, the threats to ringed seals stem principally from habitat loss associated with global climate change, a threat the State could not single-handedly mitigate. Under

NMFS's policy and the ESA, notwithstanding state conservation efforts, ''if the best available scientific and commercial data indicate that the species meets the definition of 'endangered species' or 'threatened species' on the day of the listing decision, then we must proceed with the appropriate rule-making activity under section 4 of the Act,'' *i.e.,* list the species (68 FR 15115; March 28, 2003).

Finally, in the preamble to the proposed rule we described our consideration of the effects of existing programs on the extinctions risk of the four ringed seal subspecies proposed for listing. In response to these comments from the State of Alaska, we add the following details about the State of Alaska's regulatory programs.

Under the Submerged Lands Act, the State of Alaska has authority over the submerged lands and resources therein, within an area extending from the mean high tide line to 3 nautical miles offshore. The ADNR Division of Oil and Gas (DOG) develops mitigation measures and lessee advisories as part of its best interest finding process for area-wide oil and gas lease sales. The North Slope Area-wide and Beaufort Sea Area-wide lease sales have the potential to affect ringed seals. Mitigation measures and lessee advisories identified for these lease sales include advisories that ESA-listed and candidate species may occur in the lease sale area, that lessees shall comply with recommended protection measures for these species, and that lessees must also comply with MMPA provisions. Other provisions to protect certain concentrations of resources and to protect subsistence harvest could provide some incidental benefit to ringed seals.

The Alaska Department of Environmental Conservation's (ADEC) mission involves the permitting and authorization of actions relating to oil and gas development, oil spill prevention and response, pollutant discharge, and other activities affecting Alaska's land and waters in the Arctic. State of Alaska solid waste management, water quality, wastewater, air quality, and vehicle emission standards are found in the Alaska Administrative Code (AAC) at 18 AAC 60, 18 AAC 70, 18 AAC 72, 18 AAC 50, and 18 AAC 52, respectively. Oil spill contingency plans are required under Alaska Statute AS 46.04.030 and at 18 AAC 75 for crude oil tankers, non-crude vessels and barges, oil and gas exploration facilities, oil flow lines and gathering lines, and for certain non-crude oil terminals and non-tank vessels. The ADEC contaminated sites cleanup process is governed by Alaska Statutes at Title 46 and regulations at 18 AAC 75 and 18 AAC 78.

We acknowledge that the State of Alaska's regulatory regime may provide some general benefits to ringed seals and their habitat. However, these laws and regulations do not reduce or mitigate in any material way the principal threats posed to Arctic ringed seals from the projected changes in sea ice habitat. As a result, they do not change our extinction risk assessment within this final listing determination.

*Comment 59:* Several comments were received regarding the proposed 4(d) rules requesting additional analyses to support the conclusion that they are necessary and advisable and petitioning NMFS to establish certain limitations on the application of those rules, such as excluding activities occurring outside the range of any of the subspecies of ringed seals listed as threatened.

*Response:* For species listed as threatened, section 4(d) of the ESA requires the Secretary to issue such regulations as are deemed necessary and advisable to provide for the conservation of the species. Such 4(d) protective regulations may prohibit, with respect to threatened species, some or all of the acts that section 9(a) of the ESA prohibits with respect to endangered species. Both the section 9(a) prohibitions and section 4(d) regulations apply to all individuals, organizations, and agencies subject to U.S. jurisdiction. On December 10, 2010 (75 FR 77476), we proposed to issue protective regulations for ringed seals under section 4(d) of the ESA to include all of the prohibitions in section 9(a)(1) based on a preliminary finding that such regulations were necessary and advisable for the conservation of the species. As explained above, in light of public comments and upon further review, we have determined that such regulations are not necessary at this time. The Arctic, Okhotsk, and Baltic subspecies appear sufficiently abundant to withstand typical year-to-year variation and natural episodic perturbations in the near term. The principal threat to these subspecies of ringed seals is habitat alteration stemming from climate change within the foreseeable future. This is a long-term threat and the consequences for ringed seals will manifest themselves over the next several decades. Finally, ringed seals currently benefit from existing protections under the MMPA, and activities that may take listed species and involve a Federal action will still be subject to consultation under section 7(a)(2) of the ESA to ensure such actions will not jeopardize the continued existence of the species. We therefore conclude that it is unlikely that the proposed section 4(d) regulations would provide appreciable conservation benefits. As a result, we have concluded that the 4(d) regulations are not necessary at this time. Such regulations could be promulgated at some future time if warranted by new information.

*Comment 60:* Comments were received that critical habitat is both prudent and determinable; other comments were received that critical habitat is not currently determinable and would require extensive additional study.

*Response:* Section 4(a)(3) of the ESA requires that, to the maximum extent practicable and determinable, critical habitat be designated concurrently with the listing of a species. Critical habitat is not determinable when information sufficient to perform required analyses of the impacts of the designation is lacking or if the biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat. Existing data are lacking in several areas necessary to support the designation of critical habitat, including identification and description of the physical and biological features essential to the conservation of Arctic ringed seals, and economic data which would allow for consideration of the costs of designation. We have therefore determined that designating critical habitat for the Arctic ringed seal is prudent but not determinable at this time. We will designate critical habitat for Arctic ringed seals in a subsequent rulemaking as provided under the ESA, and we are soliciting comments related to the designation (see **DATES, ADDRESSES**, and Information Solicited).

*Comment 61:* Comments were received that it is unclear how future recovery planning, including establishing accurate recovery and delisting criteria, can occur given the apparent lack of abundance data. Other comments were received expressing support for recovery planning for ringed seals.

*Response:* Section 4(f) of the ESA requires that NMFS develop recovery plans for ESA listed species, unless such a plan will not promote the conservation of the species. Section 4(f)(1)(A) of the ESA also states that in developing and implementing recovery plans, the Secretary shall, to the maximum extent practicable, ''give priority to those endangered species or threatened species, without regard to taxonomic classification, that are most likely to benefit from such plans.'' The ranges of Okhotsk, Baltic, and Ladoga

ringed seals occur entirely under the jurisdiction of other countries. These subspecies would therefore qualify for exemption from the ESA section 4(f) recovery planning process because the U.S. has little authority to implement actions necessary to recover foreign species. A recovery plan will be developed for Arctic ringed seals, provided that the limitations in section 4(a)(1)(A) of the ESA do not apply. Future recovery planning efforts for the Arctic ringed seal will incorporate the best scientific and commercial data available regarding abundance at that time, and would identify data gaps that warrant further research.

*Comment 62:* A number of comments stressed that the determination should be based on sound scientific data and analysis. Some comments suggested inappropriate factors such as political pressure from the climate change debate may have influenced our decision making.

*Response:* We were petitioned to evaluate the status of the ringed seal under the ESA. Section 4(b)(1)(A) of the ESA requires us to make listing determinations solely on the basis of the best scientific and commercial data available. Consistent with this requirement, in reaching our final listing determination, we considered the status review report prepared by the BRT, information received through public and peer review comments, and efforts being made to protect the species. This information is summarized in this final rule.

*Comment 63:* A commenter expressed the opinion that to provide a meaningful process in which interested parties could review and comment on the special peer review comments, NMFS should have made the original comment letters available (rather than NMFS's ''summary interpretation of those comments'') and opened more than a 30-day comment period.

*Response:* On April 6, 2012, we announced in the **Federal Register** the availability of a peer review report that consolidated the comments received from special peer review of the ringed seal status review report (77 FR 20773). We issued a news release to ensure that the public was made aware of this comment period. The comment period was limited to 30 days in consideration of the statutory deadline requiring a prompt final listing determination. We did not receive any specific requests to extend the comment period. The peer review report simply consolidated the comments received from the special peer reviewers to facilitate public review—the report did not provide our interpretation of those comments.

*Comments on the Consequences of the Proposed Listing Rule*

*Comment 64:* Several commenters, including the State of Alaska and the ISC, expressed concern that the ultimate effect of the listings will be additional regulatory burden and increased economic and other human impacts without significant conservation benefit. Some of these commenters noted that the proposed listing would affect an area of national significance because of its importance for domestic oil and gas development. The State of Alaska specifically expressed concern that the proposed action will cause substantial injury to Alaska's economic interests, including those of northern coastal municipal governments. The State expressed the view, for example, that the listing will deter or delay activities such as oil and gas exploration and development, and shipping operations, which could reduce State royalties and revenue. One commenter also expressed concern that the listings could also potentially cause resources and efforts to be distracted away from the conservation of populations at greater risk.

*Response:* Section 4(b)(1)(A) of the ESA states that the Secretary shall make listing determinations based solely on the best scientific and commercial data available, after conducting a status review of the species and taking into account efforts to protect the species. The regulations implementing the ESA at 50 CFR 424.11(b), consistent with case law interpreting the ESA and its legislative history, state that the listing determination will be made without reference to possible economic or other impacts of such determination. Therefore, we cannot consider such potential consequences in our final determination. However, we will consider economic impacts when designating critical habitat. We also note that such activities have been occurring despite the presence of several ESA-listed whale species in the areas.

*Comment 65:* A few commenters, including Greenland's DFHA, expressed concern that if the Arctic ringed seal is listed as threatened a negative market perception toward use of seal products could, in turn, impact trade and harm Inuit communities. These commenters suggested that the proposed listing could also result in ringed seals being listed under the Convention on the International Trade in Endangered Species (CITES), which would directly affect the trade of seal products, a vital part of the Inuit subsistence lifestyle and economic independence.

*Response:* As noted above, section 4(b)(1)(A) of the ESA states that the Secretary shall make listing determinations based solely on the best scientific and commercial data available and the regulations implementing the ESA state that the listing determination will be made without reference to possible economic or other impacts of such determinations. Therefore, we cannot consider such potential consequences in our final determination. Regarding listing under CITES, we note that the structure of CITES is similar to the ESA, in that species are listed in CITES Appendices according to their conservation status. However, listed CITES species must also meet the test that trade is at least in part contributing to their decline. We did not find this to be the case for ringed seals.

*Additional Comments*

*Comment 66:* The Marine Mammal Commission recommended that NMFS develop a research plan to address the major uncertainties and information gaps identified in the status review report, and strengthen collaborative efforts among range nations to facilitate research and management to assess the status and trends of ringed seal populations throughout the species' range, and identify protective measures where necessary. Canada's DFO noted that they remain open to exploring potential areas for cooperation for improving mutual understanding of Arctic seal populations. The Commission and another commenter expressed the view that NMFS also needs to prioritize funding to collect data on ringed seal population size and trends and many other aspects of the seal's biology, such as population structure of the Arctic subspecies, which are currently poorly understood.

*Response:* We agree that additional research is needed to help resolve areas of uncertainty and to add to the ecological knowledge of this species. We look forward to working with our partners and stakeholders in the conservation and recovery of ringed seals, including obtaining needed research to fill in knowledge gaps.

*Comment 67:* The State of Alaska and another commenter pointed out that the proposed rule referred to the ''long generation time'' of ringed seals without stating what it is. These commenters suggested this is an important parameter for population projections and population genetics assessments.

*Response:* Based solely on the type of life history that ringed (and other) seals have evolved, with high adult survival rates and low birth rates, the species is expected to have a relatively long

generation time. The age at first reproduction and the birth rate would be expected to vary somewhat between regions and years because these typically depend upon foraging conditions. Palo *et al.* (2001) estimated the generation time of ringed seals to be about 11 years, based on vital statistics reported by Smith (1973) from seals sampled in the Canadian Arctic during 1966–1970.

*Comment 68:* The State of Alaska and another commenter noted that there is a high degree of uncertainty associated with the ringed seal subspecies identified that should be more explicitly acknowledged, and they provided a number of references to support this comment.

*Response:* Although the concept of a subspecies as an identifiable taxon has been questioned by some evolutionary biologists, and has been applied inconsistently by taxonomists with respect to the nature and amount of differentiation required for subspecies designation, the concept remains in wide use and there is clearly no consensus to abandon it. In the case of ringed seals, the five subspecies designations have been in wide use for many years (for details see Kelly *et al.,* 2010a) and constitute the best scientific and commercial data available. There is clearly no means of dispersal between the landlocked subspecies in Lake Saimaa and Lake Ladoga, or between those subspecies and the remaining three subspecies. The BRT presented and considered reasonable evidence in the status review report that, although there could be some exchange of individuals between Arctic ringed seals and the subspecies in the Baltic Sea or Sea of Okhotsk, there is no documented evidence of exchange rates that would be sufficient to fuel a recovery of the latter populations if they were to become severely depleted. Thus, all five of the widely-recognized subspecies are appropriate for consideration of whether a listing is warranted.

*Comment 69:* A commenter noted that the Society for Marine Mammalogy Committee on Taxonomy currently assigns the ringed seal species and the five subspecies to the genus *Pusa* rather than *Phoca.*

*Response:* The status review report presented and considered a current lack of consensus on placement of ringed seals in the genus *Pusa* or *Phoca* (perhaps in a subgenus *Pusa*). The proposal to list ringed seals is not dependent on the nomenclature used.

## Classification

*National Environmental Policy Act (NEPA)*

The 1982 amendments to the ESA, in section 4(b)(1)(A), restrict the information that may be considered when assessing species for listing. Based on this limitation of criteria for a listing decision and the opinion in *Pacific Legal Foundation* v. *Andrus,* 657 F. 2d 829 (6th Cir. 1981), we have concluded that NEPA does not apply to ESA listing actions. (See NOAA Administrative Order 216–6.)

*Executive Order (E.O.) 12866, Regulatory Flexibility Act, and Paperwork Reduction Act*

Under the plain language of the ESA and as noted in the Conference Report on the 1982 amendments to the ESA, economic impacts cannot be considered when assessing the status of a species. Therefore, the economic analyses required by the Regulatory Flexibility Act are not applicable to the listing process. In addition, this rule is exempt from review under E.O. 12866. This rule does not contain a collection of information requirement for the purposes of the Paperwork Reduction Act.

*E.O. 13132, Federalism*

E.O. 13132 requires agencies to take into account any federalism impacts of regulations under development. It includes specific directives for consultation in situations where a regulation will preempt state law or impose substantial direct compliance costs on state and local governments (unless required by statute). Neither of those circumstances is applicable to this rule.

*E.O. 13175, Consultation and Coordination With Indian Tribal Governments*

The longstanding and distinctive relationship between the Federal and tribal governments is defined by treaties, statutes, executive orders, judicial decisions, and co-management agreements, which differentiate tribal governments from the other entities that deal with, or are affected by, the Federal Government. This relationship has given rise to a special Federal trust responsibility involving the legal responsibilities and obligations of the United States toward Indian Tribes and the application of fiduciary standards of due care with respect to Indian lands, tribal trust resources, and the exercise of tribal rights. E.O. 13175—Consultation and Coordination with Indian Tribal Governments—outlines the responsibilities of the Federal Government in matters affecting tribal interests. Section 161 of Public Law 108–199 (188 Stat. 452), as amended by section 518 of Public Law 108–447 (118 Stat. 3267), directs all Federal agencies to consult with Alaska Native corporations on the same basis as Indian tribes under E.O. 13175.

NMFS has coordinated with Alaska Native communities regarding management issues related to ice seals through co-management organizations, particularly the ISC. NMFS discussed the listing petition with the ISC and provided updates regarding the timeline for the ringed seal status review. Following publication of the proposed listing determination, we notified the ISC of the proposal and requested comments on the proposed rule.

We fully considered all of the comments received from Alaska Native organizations and tribes on the proposed rule and have addressed those comments in this final rule. In response to comments received during the public comment period that indicated some tribes may wish to consult on the proposed rule, we contacted potentially affected tribes by mail and offered them the opportunity to consult on the proposed action and discuss any concerns they may have. No requests for consultation were received in response to this mailing.

## References Cited

A complete list of all references cited in this rulemaking can be found on our Web site at *http://alaskafisheries.noaa.gov/* and is available upon request from the NMFS office in Juneau, Alaska (see **ADDRESSES**).

## List of Subjects

*50 CFR Part 223*

Endangered and threatened species, Exports, Imports, Transportation.

*50 CFR Part 224*

Endangered and threatened species, Exports, Reporting and recordkeeping requirements.

Dated: December 20, 2012.

**Alan D. Risenhoover,**

*Director, Office of Sustainable Fisheries, performing the functions and duties of the Deputy Assistant Administrator for Regulatory Programs National Marine Fisheries Service.*

For the reasons set out in the preamble, 50 CFR parts 223 and 224 are amended as follows:

## PART 223—THREATENED MARINE AND ANADROMOUS SPECIES

■ 1. The authority citation for part 223 continues to read as follows:

**Authority:** 16 U.S.C. 1531–1543; subpart B, § 223.201–202 also issued under 16 U.S.C. 1361 *et seq.;* 16 U.S.C. 5503(d) for § 223.206(d)(9).

■ 2. In § 223.102, in the table, add paragraphs (a)(4), (a)(5), and (a)(6) to read as follows:

**§ 223.102 Enumeration of threatened marine and anadromous species.**

* * * * *

| Species [1] | | Where listed | Citation(s) for listing determination(s) | Citation(s) for critical habitat designation(s) |
|---|---|---|---|---|
| Common name | Scientific name | | | |
| * | * | * * * | * | * |
| (4) Ringed seal, Arctic subspecies. | *Phoca* (=*Pusa*) *hispida hispida*. | The Arctic subspecies of the ringed seal includes all ringed seals from breeding populations in the Arctic Ocean and adjacent seas except west of 157° E. Long., or west of the Kamchatka Peninsula, where breeding populations of ringed seals of the Okhotsk subspecies are listed as threatened under § 223.102(a)(5); or in the Baltic Sea where breeding populations of ringed seals are listed as threatened under § 223.102(a)(6). | [INSERT FR CITATION & 12/28/12]. | NA |
| (5) Ringed seal, Okhotsk subspecies. | *Phoca* (=*Pusa*) *hispida ochotensis*. | The Okhotsk subspecies of the ringed seal includes all ringed seals from breeding populations west of 157° E. Long., or west of the Kamchatka Peninsula, in the Pacific Ocean. | [INSERT FR CITATION & 12/28/12]. | NA |
| (6) Ringed seal, Baltic subspecies. | *Phoca* (=*Pusa*) *hispida botnica*. | The Baltic subspecies of the ringed seal includes all ringed seals from breeding populations within the Baltic Sea. | [INSERT FR CITATION & 12/28/12]. | NA |
| * | * | * * * | * | * |

[1] Species includes taxonomic species, subspecies, distinct population segments (DPSs) (for a policy statement; see 61 FR4722, February 7, 1996), and evolutionarily significant units (ESUs) (for a policy statement; see 56 FR 58612, November 20, 1991).

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## PART 224—ENDANGERED MARINE AND ANADROMOUS SPECIES

■ 3. The authority citation for part 224 continues to read as follows:

**Authority:** 16 U.S.C. 1531–1543 and 16 U.S.C. 1361 *et seq.*

**§ 224.101 [Amended]**

■ 4. In § 224.101, amend paragraph (b) by adding the phrase ''Ladoga ringed seal (*Phoca* (=*Pusa*) *hispida ladogensis*);'' immediately after the phrase '' Killer whale (*Orcinus orca*), Southern Resident distinct population segment, which consists of whales from J, K and L pods, wherever they are found in the wild, and not including Southern Resident killer whales placed in captivity prior to listing or their captive born progeny;''.

[FR Doc. 2012–31066 Filed 12–21–12; 4:15 pm]

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