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**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**50 CFR Parts 223 and 224**

**[Docket No. 150901797-5914-01]**

**RIN 0648-XE163**

**Endangered and Threatened Wildlife; 90-Day Finding on a Petition to List the Thorny Skate as Threatened or Endangered Under the Endangered Species Act**

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

**ACTION:** 90-day petition finding, request for information.

**SUMMARY:** We, NMFS, announce a 90-day finding on a petition to list a “Northwest Atlantic Distinct Population Segment” (DPS) or “United States DPS” of thorny skate (*Amblyraja radiata*) as threatened or endangered under the Endangered Species Act (ESA). We find that the petition to list thorny skate presents substantial scientific or commercial information indicating that the petitioned action may be warranted. We will conduct a review of the status of the species to determine if the petitioned action is warranted. To ensure that the status review is comprehensive, we are soliciting scientific and commercial information pertaining to this species from any interested party.

**DATES:** Information and comments on the subject action must be received by [*insert date 60 days after date of publication in the FEDERAL REGISTER*].

**ADDRESSES:** You may submit comments, information, or data on this document, identified by NOAA-NMFS-2015-0120, by either any of the following methods:

- *Electronic Submissions:* Submit all electronic public comments via the Federal eRulemaking Portal. Go to [www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2015-0120](http://www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2015-0120). Click the “Comment Now” icon, complete the required fields, and enter or attach your comments.
- *Mail:* Submit written comments to Julie Crocker, NMFS Greater Atlantic Regional Fisheries Office, Protected Resources Division, 55 Great Republic Drive, Gloucester, MA 01930, USA.

*Instructions:* 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 by us. All comments received are a part of the public record and will generally be posted for public viewing on [www.regulations.gov](http://www.regulations.gov) without change. All personal identifying information (e.g., name, address, etc.), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. We will accept anonymous comments (enter "N/A" in the required fields if you wish to remain anonymous).

Copies of the petition and related materials are available on our website at:

<http://www.fisheries.noaa.gov/pr/species/fish/thorny-skate.html>.

**FOR FURTHER INFORMATION CONTACT:** Julie Crocker, Protected Resources Division, 978-281-9328, or Marta Nammack, NMFS-HQ, Protected Resources Office, (301) 427-8469.

**SUPPLEMENTARY INFORMATION:**

## **Background**

On May 28, 2015, we received a petition from Defenders of Wildlife and Animal Welfare Institute to list a “Northwest Atlantic DPS” of thorny skate as threatened or endangered under the ESA, or, as an alternative, to list a “United States DPS” as threatened or endangered. The petition also requests that we designate critical habitat for thorny skate. Copies of the petition are available from us (see **ADDRESSES**, above) and can be found at: <http://www.fisheries.noaa.gov/pr/species/fish/thorny-skate.html>.

## **ESA Statutory, Regulatory, and Policy Provisions and Evaluation Framework**

Section 4(b)(3)(A) of the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*), requires, to the maximum extent practicable, that within 90 days of receipt of a petition to list a species as threatened or endangered, the Secretary of Commerce make a finding on whether that petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted, and to promptly publish such finding in the **Federal Register** (16 U.S.C. 1533(b)(3)(A)). When we find that substantial scientific or commercial information in a petition indicates the petitioned action may be warranted (a “positive 90-day finding”), we are required to promptly commence a review of the status of the species concerned, during which we will conduct a comprehensive review of the best available scientific and commercial information. In such cases, within 12 months of receipt of the petition, we must conclude the review with a finding as to whether, in fact, the petitioned action is warranted. Because the finding at the 12-month stage is based on a more thorough review of the available information, as compared to the narrow scope of review at the 90-day stage, a “may be warranted” finding does not prejudice the outcome of the status review.

Under the ESA, a listing determination may address a species, which is defined to also include subspecies and, for any vertebrate species, any DPS that interbreeds when mature (16 U.S.C. 1532(16)). A joint NMFS–U.S. Fish and Wildlife Service (USFWS) (jointly, “the Services”) policy clarifies the agencies’ interpretation of the phrase “distinct population segment” for the purposes of listing, delisting, and reclassifying a species under the ESA (61 FR 4722; February 7, 1996). A species, subspecies, or DPS is “endangered” if it is in danger of extinction throughout all or a significant portion of its range, and “threatened” if it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (ESA sections 3(6) and 3(20), respectively, 16 U.S.C. 1532(6) and (20)). Pursuant to the ESA and our implementing regulations, we determine whether species are threatened or endangered based on any one or a combination of the following five section 4(a)(1) factors: the present or threatened destruction, modification, or curtailment of habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; inadequacy of existing regulatory mechanisms; and any other natural or manmade factors affecting the species’ existence (16 U.S.C. 1533(a)(1), 50 CFR 424.11(c)).

ESA-implementing regulations issued jointly by NMFS and USFWS (50 CFR 424.14(b)) define “substantial information” in the context of reviewing a petition to list, delist, or reclassify a species as the amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted. In evaluating whether substantial information is contained in a petition, the Secretary must consider whether the petition: (1) Clearly indicates the administrative measure recommended and gives the scientific and any common name of the species involved; (2)

contains detailed narrative justification for the recommended measure, describing, based on available information, past and present numbers and distribution of the species involved and any threats faced by the species; (3) provides information regarding the status of the species over all or a significant portion of its range; and (4) is accompanied by the appropriate supporting documentation in the form of bibliographic references, reprints of pertinent publications, copies of reports or letters from authorities, and maps (50 CFR 424.14(b)(2)).

At the 90-day finding stage, we evaluate the petitioners' request based upon the information in the petition including its references and the information readily available in our files. We do not conduct additional research, and we do not solicit information from parties outside the agency to help us in evaluating the petition. We will accept the petitioners' sources and characterizations of the information presented if they appear to be based on accepted scientific principles, unless we have specific information in our files that indicates the petition's information is incorrect, unreliable, obsolete, or otherwise irrelevant to the requested action. Information that is susceptible to more than one interpretation or that is contradicted by other available information will not be dismissed at the 90-day finding stage, so long as it is reliable and a reasonable person would conclude it supports the petitioners' assertions. In other words, conclusive information indicating the species may meet the ESA's requirements for listing is not required to make a positive 90-day finding. We will not conclude that a lack of specific information alone negates a positive 90-day finding if a reasonable person would conclude that the unknown information itself suggests an extinction risk of concern for the species at issue.

To make a 90-day finding on a petition to list a species, we evaluate whether the petition presents substantial scientific or commercial information indicating the subject species may be either threatened or endangered, as defined by the ESA. First, we evaluate whether the information presented in the petition, along with the information readily available in our files, indicates that the petitioned entity constitutes a “species” eligible for listing under the ESA. Next, we evaluate whether the information indicates that the species faces an extinction risk that is cause for concern; this may be indicated in information expressly discussing the species’ status and trends, or in information describing impacts and threats to the species. We evaluate any information on specific demographic factors pertinent to evaluating extinction risk for the species (e.g., population abundance and trends, productivity, spatial structure, age structure, sex ratio, diversity, current and historical range, habitat integrity or fragmentation), and the potential contribution of identified demographic risks to extinction risk for the species. We then evaluate the potential links between these demographic risks and the causative impacts and threats identified in section 4(a)(1).

Information presented on impacts or threats should be specific to the species and should reasonably suggest that one or more of these factors may be operative threats that act or have acted on the species to the point that it may warrant protection under the ESA. Broad statements about generalized threats to the species, or identification of factors that could negatively impact a species, do not constitute substantial information indicating that listing may be warranted. We look for information indicating that not only is the particular species exposed to a factor, but that the species may be responding in a negative fashion; then we assess the potential significance of that negative response.

Many petitions identify risk classifications made by nongovernmental organizations, such as the International Union on the Conservation of Nature (IUCN), the American Fisheries Society, or NatureServe, as evidence of extinction risk for a species. Risk classifications by other organizations or made under other Federal or state statutes may be informative, but such classification alone may not provide the rationale for a positive 90-day finding under the ESA. For example, as explained by NatureServe, their assessments of a species' conservation status do “not constitute a recommendation by NatureServe for listing under the U.S. Endangered Species Act” because NatureServe assessments “have different criteria, evidence requirements, purposes and taxonomic coverage than government lists of endangered and threatened species, and therefore these two types of lists should not be expected to coincide”

<http://www.natureserve.org/prodServices/pdf/NatureServeStatusAssessmentsListing-Dec%202008.pdf>). Additionally, species classifications under IUCN and the ESA are not equivalent, and data standards, criteria used to evaluate species and treatment of uncertainty are also not necessarily the same. Thus, when a petition cites such classifications, we will evaluate the source of information that the classification is based upon in light of the standards on extinction risk and impacts or threats discussed above.

### **Distribution and Life History of Thorny Skate**

The thorny skate occurs on both sides of the Atlantic. In the western North Atlantic, it ranges from western Greenland to South Carolina, and in the eastern North Atlantic, it ranges from Iceland to the southwestern coasts of Ireland and England (Bigelow and Schroeder, 1953). This species is characterized by a row of 11 to 19 large thorns running down the midline of the back and tail (Bigelow and Schroeder, 1953;

Collette and Klein-MacPhee, 2002). Thorny skate are generally brown dorsally with a white ventral surface. They may reach lengths of over 39 inches (991 mm), but maximum size varies over its range.

According to Collette and Klein-MacPhee (2002), females deposit a single fertilized egg capsule, which ranges in size from 2 to 4 inches (48 to 96 mm) in length and 1.33 to 3 inches (34 to 77 mm) in width. While females with fully formed egg capsules are captured year round, the percentage of mature females with capsules is highest during the summer (Collette and Klein-MacPhee, 2002). Thorny skate feed on benthic invertebrates and fish. Thorny skates are found over a wide variety of substrates including sand, broken shell, gravel, pebbles, and soft mud and are primarily found from 20 to 3,900 feet (18 to 1200 m) deep (Collette and Klein-MacPhee, 2002). They appear to make seasonal migrations that have been noted on the Scotian Shelf and the Grand Banks, but specific details on the spatial patterns and timing are lacking (NEFSC, 2003). Kulka and Miri (2003) report a change in the spring and fall distributions resulting in a higher density and greater proportion of biomass being found in deeper waters during the spring. These aggregations, they note, appear to be correlated with warmer relative temperatures.

Sulikowski *et al.* (2005) aged thorny skate in the Gulf of Maine and estimated the oldest age to be 16 years for both males and females. For females, 50 percent maturity occurred at approximately 11 years and 875 mm (34.5 inches) total length (TL); while for males, approximately 10.9 years and 865 mm (34 inches) TL (Sulikowski *et al.*, 2006).

#### **Analysis of Petition and Information Readily Available in Our Files**

We have determined, based on the information provided in the petition and readily available in our files, that substantial information is presented in the petition indicating that the petitioned action may be warranted. The petition contains a recommended administrative measure, provides the scientific and common name, contains a detailed narrative justification for the recommended measure, provides information on the status of the species, and includes supporting documentation. Below is a synopsis of our analysis of the information provided in the petition and readily available in our files to determine whether a reasonable person would conclude that an endangered or threatened listing may be warranted as a result of any of the factors listed under section 4(a)(1) of the ESA.

#### *Population Trends*

The petitioners state that the IUCN lists the U.S. population of thorny skates as “Critically Endangered” and the Canadian population as “Vulnerable” throughout its range in the Northwest Atlantic Ocean. They conclude that the IUCN categorization proves that reasonable people have determined that the best available scientific evidence shows that the species is likely to be endangered or threatened as those terms are defined in the ESA. They state that the IUCN classification of the U.S. population of thorny skates as “Critically Endangered” means that the species is as close to extinction in the wild as possible. However, species classifications by the IUCN and under the ESA are not equivalent. We will evaluate the information that the IUCN classification is based upon in light of the ESA’s standards on extinction risk and impacts or threats discussed previously.

The IUCN reviewed the status of thorny skate in 2004 and concluded that the extent of decline warranted an assessment of vulnerable globally, but critically endangered in U.S. waters. They noted that the species was relatively stable in recent years in Canada and the Northeast Atlantic yet declining in the United States. The species was assessed as “Least Concern” in the Northeast Atlantic. They also noted that the overall abundance (whether divided among subpopulations or not) still constitutes several hundred million individuals. The minimum biomass for the Northwest Atlantic was estimated at 100,000 tons, which has been stable or increasing slightly over the last 15 years. The reasons cited for the IUCN’s critically endangered classification for U.S. waters include low relative abundance (below the fisheries limit reference point), the long-term population decline, lack of population increase despite strict management laws, and the inability to monitor species-specific landings.

The petitioners cite the 2008 Skate Stock Assessment and Fishery Evaluation (SAFE) Report prepared by the Northeast Fisheries Science Center (NEFSC) as demonstrating a precipitous decline in thorny skate abundance and biomass in United States waters since the late 1970s. Skate biomass has been monitored annually by the NEFSC bottom trawl survey since 1963. The survey occurs from Cape Lookout to the Scotian Shelf. Currently, this survey is the only long-term, comprehensive source of information on the relative abundance of thorny skates in U.S. waters, which are primarily distributed in the Gulf of Maine. Based on this information, the survey biomass index of thorny skates has steadily declined from a high 3-year average of 6.17 kg/tow in 1969 to 1971, to a low of 0.12 kg/tow in 2011 to 2013. The petition notes that when the Northeast skate complex Fishery Management Plan (FMP) was implemented by us in

2003, thorny skate was determined to be “overfished” because the biomass index that year (0.74 kg/tow) was below the established biomass threshold (2.2 kg/tow) and below the biomass target (4.41 kg/tow). The petitioners correctly note that the current biomass threshold and biomass target are 2.06 and 4.13 kg/tow, respectively. The petitioners correctly state that the most recent 3-year average mean biomass survey from 2011 – 2013 (0.12 kg/tow) is the lowest in the time series and that we have determined that overfishing is occurring. A stock that is subject to overfishing has a harvest rate higher than the rate that produces its “maximum sustainable yield” (MSY). MSY is the largest long-term average catch that can be taken from a stock under prevailing environmental and fishery conditions. A stock that is overfished has a population size that is too low and would jeopardize the stock’s ability to produce its MSY. “Overfished” can be the result of many factors, including, but not limited to, overfishing.

The petitioners further state that Canadian indices of thorny skate have also demonstrated a precipitous decline over the past four decades. They reference a report by Canada’s Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2012) noting that thorny skate dominates Canadian catches of skate species, composing approximately 90 percent of rajids caught in survey trawls (COSEWIC 2012). In 2012, COSEWIC, which was established as a legal entity under Canada’s Species at Risk Act, published an assessment of the status of thorny skate in Canada and classified thorny skate as a “species of special concern;” COSEWIC assessments are considered advice to the Government of Canada on the status of wildlife species, but it is up to the Governor in Council (a subcommittee of federal cabinet ministers), on the recommendation of the Minister of the Environment, to decide whether such species should be added to the List

of Wildlife Species at Risk. A COSEWIC assessment of “species of special concern” means that thorny skate may become “a threatened or an endangered species because of a combination of biological characteristics and identified threats.” COSEWIC made this designation because the species has undergone severe population declines over the southern part of its distribution in Canada (specifically, the Scotian Shelf/Bay of Fundy and Georges Bank areas), its range has contracted, and declines have continued in spite of a reduction in fishing mortality. However, the report also notes that the abundance of mature individuals in the northern part of its range has been increasing and is approaching 1970s abundance levels. The report indicates that on the Scotian Shelf and Bay of Fundy, the abundance of immature skates has declined over 76 percent from 1970 to 2010 and that the rate of decline for mature skates was 95 percent over the same period. The authors note that there is no evidence that these declines are due to individuals moving north. The report also indicates that the abundance of juvenile thorny skates on Georges Bank declined by 40 percent from 1987-2008, and the abundance of adults declined by 85 percent over the same period. In the southern Gulf of St. Lawrence, abundance of thorny skate of all sizes has fluctuated between 1971 and 2010 and was lower at the end of the time series. The report notes that adults declined by 95 percent from 1971-2010 and that this matches increases in natural mortality over this period (citing Benoit and Swan 2011). The rate of decline for juveniles over this period was 32 percent, although there was an increase from 2003-2010. They note the uncertainty with how an apparently large number of juveniles could be produced by so few adults. Abundance trends could not be calculated for the Baffin Bay/Davis Strait/Ungava Bay region. Based on limited data, the report concludes that thorny skate

abundance in the Grand Banks to Labrador Shelf area has fluctuated without trend between 1978 and 2010. On the southern Labrador Shelf, thorny skate declined until 1995 and then stabilized or increased thereafter. For example, adults declined by 91 percent from 1997 to 1994 but subsequently increased by 821 percent from 1995 to 2008. Similar patterns of decline and then increased abundance are reported for the Grand Banks.

The petitioners state that since the mid-1980s, the range of the thorny skate on the Grand Banks has been contracting (Kulka and Miri 2003). They cite evidence of a hyper-aggregation with 80 percent of the biomass now concentrated in 20 percent of the area along the southwest slope of the Grand Banks (Kulka *et al.* 2007). As noted by Kulka *et al.* (2006), in the early 1980s, thorny skates were distributed over the entire Grand Banks in moderate to high concentrations, but by the late 1990s, much of the biomass was concentrated in the southwest. The proportion of the surveyed area containing no skates increased from about 2 percent in 1980 to 1988 to 22 percent in 2004 to 2005. During 1980 to 1988, about 57 percent of the biomass was located within 20 percent of the survey area, by 2001 to 2005, 78 percent of the biomass was concentrated into 20 percent of the survey area. Therefore, the area occupied by thorny skates has decreased, and the population has become increasingly more concentrated in a smaller area where bottom temperatures are warmest. A very similar pattern of aggregation was observed for northern cod just prior to its collapse (Rose and Kulka 1999). Kulka and Miri (2003) state that aggregation and reduced area of occupancy led to the cod being increasingly more vulnerable to exploitation and they state this is very similar to what is happening to thorny skate. They do acknowledge that it is unknown whether these spatial dynamics

are an indication of a skate stock under stress. The 2007 update by Kulka and Miri noted that the species had shown a minor re-expansion in its distribution in the past 3 to 4 years.

Kulka and Miri (2006) noted that the average weight of thorny skate had declined from 2 kg in the early 1970s to 1.2 kg in 1996 with the majority of this decline occurring in the 1990s concurrent with the decline in biomass. They reported that average size had increased to about 1.6 kg since that time. They note that the decline of thorny skate, particularly on the northern Grand Banks, is concurrent in space and time with the decline of many other demersal species and occurred during a period when bottom temperatures were below average.

In conclusion, in the southern part of its range in Canada, and in the United States, we find evidence suggesting that population abundance of thorny skate has continued to decline, and in the northern part of its range thorny skate may be stable at a diminished abundance. While data are still limited with respect to population size and trends, we find the petition and our files contain sufficient information on thorny skate trends and status to indicate that the petitioned action may be warranted.

### **Analysis of DPS Information**

The petition requests that we list the thorny skate population in the Northwest Atlantic as a threatened or endangered DPS and presents arguments that thorny skate in the Northwest Atlantic meet the criteria to be considered a DPS, as described in the 1996 joint NMFS and the U.S. Fish and Wildlife Service DPS policy (61 FR 4722; February 7, 1996). Alternatively, the petition requests that we list the thorny skate population in the United States as a threatened or endangered DPS and presents arguments that thorny

skate in U.S. waters meet requirements for being identified as a DPS eligible for listing. Our DPS policy identifies two elements that must be considered when identifying a DPS: (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 to which it belongs. 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—quantitative measures of genetic or morphological discontinuity may provide evidence of this separation; 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. If a population segment is considered discrete under one or more of the above conditions, its biological and ecological significance will then be considered in light of Congressional guidance (see Senate Report 151, 96th Congress, 1<sup>st</sup> Session) that the authority to list DPSs be used “sparingly” while encouraging the conservation of genetic diversity. In carrying out this examination, the Services will consider available scientific evidence of the discrete population segment’s importance to the taxon to which it belongs. This consideration may include, but is not limited to, the following: (1) Persistence of the discrete population segment in an ecological setting unusual or unique for the taxon; (2) evidence that loss of the discrete population segment would result in a significant gap in the range of a taxon; (3) evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population

outside its historic range; or (4) evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.

The petitioners state the Northwest Atlantic thorny skate population, encompassing Canadian and U.S. waters, satisfies both the “discrete” and “significant” requirements for DPS identification. They state that the Northwest Atlantic population is discrete because it is markedly separated from other populations due to physical and biological factors.

The petitioners describe the results of tagging studies (Templeman 1984, Templeman 1987, Walker *et al.* 1997) and suggest that thorny skate are a relatively sedentary species in both the Northwest and Northeast Atlantic. They use the maximum distance traveled from a tagging location (386 km; Templeman 1984), the small portion of the tagged individuals that traveled more than 161 km (13 percent; Templeman 1984) in the Northwest Atlantic, the small portion of tagged individuals that traveled more than 93 km in the North Sea (15 percent; Walker *et al.* 1997), and the conclusions of Templeman (1987) that “large scale migrations did not occur” between the Grand Banks and Labrador Shelf to conclude that long distances may hinder thorny skates from embarking on long enough migrations to travel between the Northeast and Northwest Atlantic. The petitioners claim that there is no indication that a significant portion of the populations travel between the Northeast and Northwest Atlantic. These studies rely solely on conventional tagging data and only report the distance between the tagging location and the location of recapture. It is unknown if the maximum distances reported between tagging and recapture location are in fact reflective of the maximum normal or maximum possible migration distance. However, as noted in the 2015 petition, if this is

interpreted to mean that the maximum migration is 386 km, this is not far enough to allow for trans-Atlantic migration, and this could support the petitioner's claim that separate, isolated Northwest and Northeast Atlantic populations of thorny skate exist.

The petitioners present some information on available genetic studies of thorny skate. They state that the findings of Coulson *et al.* (2011) suggest that genetic diversity may exist in thorny skate and that this is indicative of population structure. The petitioners also address the findings of Chevolet *et al.* (2007) and question the validity of Chevolet *et al.*'s conclusions. The results of Coulson *et al.* (2011) indicate that thorny skate showed the highest level of within-species divergence (0.8 percent) across all skate species from Atlantic Canada examined, but this was largely due to a single individual, collected off the Gulf of Maine, with 3–4 percent sequence divergence from the other thorny skates examined. Coulson *et al.* (2011) also note that, with the exception of one other species (for which only two samples were tested), thorny skate showed the highest levels of both haplotype and nucleotide diversity; this was true even when the Gulf of Maine sample was excluded.

The petitioners interpret Chevolet *et al.* (2007) to note that the near absence of genetic differentiation in thorny skate over the North Atlantic does not conform to predictions based on life history characteristics, and they acknowledge that the lack of power related to small sample size and the use of only one molecular marker might explain this. However, the authors note that a parallel study using the same marker for another skate species did find strong and highly significant structure at the ocean basin scale. The petitioners claim that this is not credible because the other study (Chevolet 2006) deals with a different skate species with different phylogeographic and population

genetic structure patterns and because it does not minimize the problems associated with a small sample size. The only other information in our files is a study (Ostrow *et al.* 2008) that concluded there was no significant population structuring between phenotypically different thorny skate within the Gulf of Maine or between thorny skate samples from the Gulf of Maine and Canada. This suggests that mixing may occur between thorny skate in the Gulf of Maine and Canada. The authors also concluded that the number of migrants between the Gulf of Maine and Canada indicated large amounts of gene flow suggesting that genetic isolation had not occurred between any of the groups. The petitioners also note a statement in COSEWIC (2012) that states that large morphological and reproductive differences among thorny skates in different areas in conjunction with indications of minimal migration suggest that there could be spatial variation in population structure.

The available genetic studies present conflicting information on the potential for significant differences between populations of thorny skate. We conclude that, viewed together, the genetics and tagging information presented in the petition combined with the information in our files present sufficient evidence that the DPS policy's criterion for discreteness may be met for the Northwest Atlantic population of thorny skate.

The petitioner argues that thorny skate in the Northwest Atlantic are significant because the loss of this population would result in a significant reduction in the species' range with no significant evidence that populations outside of this range could recolonize these waters. While not clearly stated, we presume the petitioners based this on the tagging information presented in their arguments for discreteness. The petitioners also claim that the separate assessments and classifications of the Northwest and Northeast

Atlantic stocks of thorny skate by the IUCN are evidence that the populations are discrete and significant. The petitioners do not present any analysis to support the claim that the IUCN stock determination is equivalent to a determination that a population meets the significance criterion in the DPS policy. However, based on the tagging information, we conclude that the petition presents sufficient evidence that the DPS policy's criterion for significance, particularly the "significant gap" consideration, may be met for the Northwest Atlantic population of thorny skate. Because the Northwest population of thorny skate may qualify as a DPS, we will consider it a potentially listable entity for purposes of this 90-day finding, and whether the Northwest Atlantic population of thorny skate constitutes a DPS will receive further analysis in the status review.

The petition claims the thorny skate population in U.S. waters also satisfies the discreteness and significance criteria for DPS designation. The petition claims that the U.S. population is discrete, because it is delimited by international governmental boundaries (delineating the United States and Canada) and significant differences exist in the control of exploitation, conservation status, and regulatory mechanisms. The petition presents information on differences in management regimes between the United States and Canada, notably that possession and landing of thorny skate is prohibited in the United States and a directed fishery occurs for thorny skate in Canada and suggests that regulatory mechanisms in Canada are inadequate. The petition also describes management by the Northwest Atlantic Fisheries Organization (NAFO), which sets catch limits for thorny skate in the Northwest Atlantic. The petitioners claim that evidence suggests that the U.S. DPS may be discrete because it is markedly separated from the Canadian population as a consequence of physical and/or ecological factors. To support

this, the petitioners point to the hyper-aggregated population along the southwest slope of the Grand Banks in Canadian waters (Kulka *et al.* 2007) and the relatively concentrated populations of thorny skates in the Gulf of Maine and Georges Bank offshore strata in U.S. waters (NEFMC 2009). The petitioner argues that the thorny skate population in the United States is also significant because the loss of this population would result in a significant gap in the species' range. We find that the petition presents substantial evidence that the DPS policy's criteria for discreteness and significance may be met for the U.S. population of thorny skate. Because the U.S. population of thorny skate may qualify as a DPS, we will consider it a potentially listable entity for purposes of this 90-day finding, and whether the U.S. population of thorny skate constitutes a DPS will receive further analysis in the status review.

#### **Analysis of ESA Section 4(a)(1) Factors**

The petition provides information on all five factors but asserts that the continued survival of the thorny skate is endangered by three of the five factors specified in section 4(a)(1) of the ESA: (B) overutilization for commercial, recreational, scientific, or educational purposes; (D) inadequacy of existing regulatory mechanisms; and (E) other natural or manmade factors affecting its continued existence.

##### *Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*

Skates are harvested in two different fisheries, one for lobster bait and one for wings for food. The fishery for lobster bait is a more historical and directed skate fishery, involving vessels primarily from Southern New England ports that target a combination of little skates and to a much lesser extent, juvenile winter skates. The fishery for skate wings evolved in the 1990s as skates were promoted as an underutilized species. The

wing fishery involves a larger number of vessels located throughout the region. Vessels tend to catch skates when targeting other species like groundfish, monkfish, and scallops and land them if the price is high enough (NEFMC 2009).

Thorny skates in the Atlantic U.S. Exclusive Economic Zone have been managed under authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) by the New England Fishery Management Council's fishery management plan for the Northeast (NE) Skate Complex (Skate FMP) since September 2003. Since that time, possession and landing of thorny skates has been prohibited, but the survey biomass index has continued to decline. It is important to note that based on the limited productivity of this species (long-lived, late maturity, low fecundity, etc.), rebuilding to target levels (4.12 kg/tow) was estimated to take at least 25 years (i.e., 2028) (NEFMC 2009). The thorny skate's low productivity makes it vulnerable to exploitation, but also suggests that the population is inherently slow to respond to fishery management efforts.

The petition states that population estimates for the thorny skate in Canadian waters indicate stable, but not increasing numbers, and in the waters of the United States, biomass indices have been declining for decades, despite the federal ban on the landing and possession of thorny skates since 2003. The petition claims that thorny skate populations have been historically exploited at unsustainable rates. They state that participation in the commercial skate wing fishery in the Northwest Atlantic has grown dramatically over the past 30 years. They cite the initiation of a directed skate fishery in Canada in 1994 and an increase in skate landings in U.S. waters between the early 1980s and 2007. The petitioners note that biomass indices in Canada indicate that the species is

maintaining relatively stable population numbers at very low levels. They claim the thorny skate population in U.S. waters continues to decline and state that the lack of regulation prior to 2003 reduced the population. The petitioners claim that current, and historical, overfishing has deleterious effects on the species population in U.S. waters and is a significant factor in the species' continued decline.

The petitioners claim that reports of illegal thorny skate landings suggest that thorny skates are being exploited in the commercial wing market. They state that in the United States prior to August 2014, skate landings were not required to be reported by species. They cite NEFMC (2009), reporting that thorny skate wings composed 6.7 percent and 3 percent of the sampled dockside landings of skate wings in Massachusetts and Maine, respectively, from 2006-2007. However, according to port sampler data provided by the NMFS Greater Atlantic Regional Fisheries Office's Analysis and Program Support Division, the occurrence of thorny skates in skate wing landings has been significantly reduced since 2006. Out of 50,653 skate wings sampled between 2007 and 2010, only 353 (0.7 percent) were identified as thorny skate wings. The available information does not suggest that illegal landings are impacting thorny skate populations to a degree that raises concern that the species may be at risk of extinction.

The petitioners acknowledge that in contrast to Canada's directed thorny skate fishery, in the United States, thorny skates are primarily taken as bycatch in groundfish trawl fisheries. They also acknowledge that the prohibition on retention of the species means fishermen are banned from possessing or landing thorny skates or their parts, and Federal regulations mandate the discard of any incidentally caught thorny skates. The petition cites the 2009 and 2010 Standardized Bycatch Reporting Methodology (SBRM;

Wigley *et al.* 2011) reports, which indicate that roughly 70 percent of all skates caught in various fisheries were discarded. We reviewed the SBRM reports for later years (Wigley *et al.* 2015, 2014, 2013 and 2012); these reports indicate that 49-63 percent of skates caught between July 2010 and June 2014 were discarded. The petitioners claim the possibility of egregious mis- and under-reporting of skate discards. However, other than noting that only 10 percent of selected otter trawl vessel total trips were observed under the Northeast Fisheries Observer Program, the petitioners provide no substantial information to support this claim of mis-reporting or under-reporting of skate discards. The available information does not suggest that mis-reporting or under-reporting is impacting thorny skate populations to a degree that raises concern that the species may be at risk of extinction.

The petitioners cite an estimate of 3,594 tons of thorny skate discarded from otter trawl fisheries in U.S. waters from 2003-2010. The petitioners claim that post-discard mortality for thorny skate is high and exacerbates the thorny skate's population decline and critically threatens stock rebuilding efforts. The petitioners cite Mandleman *et al.* (2013) as support for their claim of high post-discard mortality. This study indicates that while 72-hour post-discard mortality of a sample of individuals retained in captivity following cage trials was only 22 percent, the condition of many of the individual thorny skate was poor (52 percent injury rate at time of capture; most with listless appearance and lack of vigor at the end of the 72-hour period) and 7 day mortality was 66 percent. The authors note that the species may be less resilient than indicated by the 22 percent 72-hour mortality rate and cautions against the use of the 22 percent mortality rate in management. The effects of captivity on these mortality rates are unknown. Further

review is necessary to determine if this level of fishery-related mortality is a threat to thorny skate, but we cannot discount it as a possible threat to the species.

Given the evidence of historical exploitation of the species and subsequent population declines, the continued bycatch of thorny skate, and the potentially high post-discard mortality rate, the information in the petition and in our files leads a reasonable person to conclude that the petitioned action may be warranted.

#### *Inadequacy of Existing Regulatory Mechanisms*

The petitioners claim that a general lack of species-specific identification, both on-boat and at landing, poses a significant threat to the thorny skate's survival in U.S. waters and that because thorny skate are a prohibited species, the likelihood that the landings are underreported is strong. They also state that misidentification and mislabeling is a problem. The petitioner states that positive species identification at landing is hindered because current regulations allow vessels to possess and/or land skates as wings only (wings removed from the body of the skate and the remaining carcasses discarded). The petitioners also state that the designation of thorny skates as "prohibited", "overfished" and "subject to overfishing" allows room for inconsistent enforcement of the law. The petition states that the existing regulatory mechanisms provided for in the 2003 FMP are ineffective.

As noted in the petition, in 2013, we determined that overfishing is occurring for thorny skate. The determination that overfishing is occurring is made when there is a decrease of more than 20 percent between two consecutive moving averages of the biomass index. The 2011-2013 3-year average biomass index (0.12 kg/tow) is only 3

percent of the species' biomass target. This 3-year average index represents an approximately 33 percent decrease from the 2010-2012 3-year moving average (0.18 kg/tow). While not noted in the petition, in an August 2014 memorandum (August 22, 2014 memo from NEFSC to GARFO) we determined that based on new survey data collected through autumn 2013/spring 2014, thorny skate remained overfished and overfishing was still occurring. Because thorny skate are a long lived species, the species may be slow to respond to management measures. However, the determination that overfishing is occurring suggests that, despite the ban on possession or landing, fishing mortality is a threat that may warrant further consideration.

As noted in the petition, the framework for the FMP for the Northeast skate complex was adjusted in 2014 to implement a 30 percent reduction in the skate Acceptable Biological Catch (ABC). However, as noted in the petition, the **Federal Register** notice announcing the availability of Framework Adjustment 2 acknowledges that while these reductions in catch limits are expected to address the current overfishing status for winter skates (not its overfished condition), the New England Fishery Management Council intends to develop a new skate action in 2014 to address overfishing and rebuild overfished thorny skates. The petition correctly notes that the Framework Adjustment 2 was not designed to address overfishing of thorny skates and correctly notes that as of the date of the petition, no new management action for thorny skate has been proposed.

While the determinations that thorny skate is overfished and that overfishing is occurring do not alone indicate that the species may be at risk of extinction, thorny skate biomass in the United States continues to decline and appears to be at historically low

levels, and information was presented suggesting that fishing may be a contributing factor to this decline. Based on the information presented in the petition as well as information in our files, we find that further evaluation of the adequacy of existing regulatory measures in the United States is needed.

While the historical lack of species-specific trends in landings and discards has hampered stock assessment efforts, recent data collection efforts have greatly improved our understanding of the species composition of the landings. As noted in the petition, in August 2014, the reporting standard was changed. Framework Adjustment 2 to the Northeast Skate FMP requires all landings be reported by one of the seven specific skate species or by “little/winter skate” if an unknown mix of the two species exists. Thorny skate wings are easily distinguishable from legal winter skate wings with a minimal amount of training, and port samplers and enforcement agents have received this training. Landing of thorny skates may have been more frequent in the past, but it has been dramatically curtailed since the prohibition on possession went into effect. Mislabeling of skate products does not appear to be widespread at U.S. ports, but port agents and enforcement agents have been trained to correct mislabeling if they observe it. The only information on mislabeling presented in the petition was about one specimen from a seafood show in Brussels, Belgium, which we view as not relevant to a potential listing in the United States. We conclude that the petition does not present sufficient information to determine that issues with landings data, misidentification or mislabeling are impacting thorny skate populations to a degree that raises concern that the petitioned action may be warranted.

The petition also states that regulatory mechanisms in Canada are inadequate to protect thorny skate. They claim that by adopting NAFO's suggested total allowable catch (TAC) limits for skate, Canada has implemented regulations that have not successfully promoted stock rebuilding. Finally, the petition also states that Canada lacks substantive protective regulatory mechanisms for thorny skate and has not afforded a conservation status by COSEWIC. As reported in the petition, thorny skate abundance indices have stabilized in Canadian waters in recent years while biomass indices have gradually increased (DFO 2013), but both indices are at historically low levels. The petitioners argue that while the average reported annual catch from NAFO Division 3LNO from 2009-2011 is less than half the current TAC, there has been minimal to no rebuilding of the stock during this period. The petitioners claim there are no indications the stock is recovering since it was brought under management and argue that both the current TAC (reported by the petitioners as 7,000 tons, citing NAFO 2012) and the reported average skate catches are too high to promote any stock recovery. The most recent stock assessment of thorny skate in NAFO Subdivision 3PS (inside Canada's 200-mile limit) indicates the TAC has been continually reduced since 2004 (13,500 tons) and is currently at 8,500 t (DFO 2013). The Canadian research survey abundance for Subdivision 3Ps was relatively stable from 1993-2012, while the survey biomass index indicated a gradually increasing trend (DFO 2013). In NAFO divisions 3LNO, Canadian research survey indices declined rapidly until the early 1990s; abundance indices were relatively stable in 1993-2012, while the survey biomass indices have generally been increasing (DFO 2013). DFO 2013 acknowledges that since the 1980s, thorny skate has undergone substantial changes in its distribution and has become increasingly aggregated

in subdivision 3Ps, and on the southern part of the Grand Banks. They state that this results in a decreasing area of occupancy and increasing catch rates in commercial fisheries occurring in those aggregation areas. The report also indicates that discarding of skate bycatch at sea remains unreported by Canadian and other fishers, which results in higher removals of thorny skate than available fisheries statistics indicate and that commercial skate landings from Canada's EEZ are not required to be reported by species. The report concludes that despite a number of years of reduced commercial landings, there was no recovery of thorny skate in the 3LNOPs stock area despite apparently stable abundance in the 3Ps portion and that biomass and abundance indices for the entire division 3LNO and subdivision 3Ps thorny skate stock area remain at relatively low levels. Based on the information presented in the petition as well as information in our files, we find that further evaluation of the adequacy of existing regulatory measures outside of the United States is needed. Given the information presented above, the information in the petition and in our files leads a reasonable person to conclude that the petitioned action may be warranted.

*Other Natural or Manmade Factors Affecting Its Existence*

The petition claims that global warming poses a long-term threat to Northwest Atlantic thorny skates and their recovery from depletion. They state that the documented global ocean warming trend could result in a change in species composition in northern waters which could adversely affect the thorny skate's predator-prey dynamics or introduce new pathogens that could harm thorny skates. The petitioners provide information on sea surface temperatures and hydrography in the Gulf of Maine and state that one outcome will be reductions in phytoplankton productivity. While they state that

changes at the lower levels of the food web may have consequences to animals at higher trophic levels, they provide no information on the impacts of these changes on thorny skate. The petitioners have not provided substantial information indicating that potential impacts to lower levels of the food web are causing detrimental effects to thorny skate or may be contributing or may, in the foreseeable future, contribute significantly to population declines of thorny skate to the point where the petitioned action may be warranted.

They also state that global warming could result in a contraction of the range of cold-water species such as the thorny skate. They speculate that a range contraction could be a potential factor in the decrease in thorny skate biomass in the Gulf of Maine and that the amount of thermal habitat in the 5 to 15°C range has decreased over the past two decades. The petitioners state that the majority of thorny skates are not capable of journeys of more than 96 km and the farthest an individual has been documented traveling is 386 km (citing Templeman 1984) and that, as such, a large-scale northern migration to move away from warming waters in the southern portion of their range appears unlikely. As noted above, it is unclear what the actual maximum migratory distance for a thorny skate is. The petitioners also claim that thorny skate have experienced a northward shift in the center of their biomass. More research is necessary to investigate if there is a correlation between Gulf of Maine water temperatures and thorny skate biomass, but the available information on thorny skate temperature preferences suggests that this could be a possibility.

There is uncertainty regarding the role of temperature in driving or contributing to the historical and current distribution and abundance of thorny skate and even greater

uncertainty regarding potential future impacts of climate change. Impacts from climate change to habitat availability or suitability could pose particular problems for U.S. populations of thorny skate as they are at the southern extent of the range of the species and are at historically low levels of abundance. Further review is necessary to determine if climate change is a threat to thorny skate. Given the evidence of range contraction and the uncertainty regarding the role of warming ocean waters, we conclude that the information in the petition and in our files suggests that climate change, and warming ocean waters specifically, may be impacting thorny skate to a degree that raises concern over their continued persistence and that should be further evaluated in a status review.

The petitioners claim that hypoxia (oxygen deficiency) has increased in frequency, duration, and severity in coastal waters and that this decreases the abundance and diversity of benthic macrofauna (citing CSIS 2011). They also claim that the combination of hypoxia and increased water temperature would reduce the quality and size of suitable habitat for aerobic organisms whose suitable habitat is restricted by water temperature and claim that thorny skate is such a species. While acknowledging that any prediction of the effects of hypoxic zones on thorny skates is speculative, the petitioners state that any adverse impact on the species or on the abundance/distribution of its predators or prey will severely hinder the species' ability to recover. However, neither the petitioners nor the information in our files indicate that thorny skate are impacted by hypoxia or that hypoxia may be contributing significantly to population declines in thorny skates to the point where the species may be at a risk of extinction. As such, we conclude that the information presented in the petition on the threat of hypoxia does not

provide substantial information indicating that hypoxia may be impacting thorny skate to a degree that the petitioned action may be warranted.

The petitioners state that the life history characteristics of thorny skate place the species at risk of adverse effects resulting from natural stochastic events. However, neither the petitioners nor the information in our files indicate that natural stochastic events are causing detrimental effects to the species or may be contributing significantly to population declines in thorny skates to the point where the species may be at a risk of extinction. As such, we conclude that the information presented in the petition on the threat of natural stochastic events does not provide substantial information indicating that such events may be impacting or may, in the foreseeable future, impact thorny skate to a degree that the petitioned action may be warranted. However, given all of the information presented above on other natural and manmade factors, particularly the warming of oceans, the information in the petition and in our files does lead a reasonable person to conclude that the petitioned action may be warranted, and it is necessary to consider the impacts from other natural and manmade factors in a status review.

#### **Summary of ESA Section 4(a)(1) Factors**

We conclude that the petition presents substantial scientific or commercial information indicating that a combination of three of the section 4(a)(1) factors (overutilization for commercial, recreational, scientific, or educational purposes; inadequate existing regulatory mechanisms; and other natural or manmade factors) may be causing or contributing to an increased risk of extinction for thorny skate which needs to be further evaluated in a review of the status of the species.

## **Petition Finding**

After reviewing the information contained in the petition, as well as information readily available in our files, and based on the above analysis, we conclude the petition presents substantial scientific information indicating the petitioned action of listing a Northwest Atlantic or United States DPS of thorny skate as threatened or endangered may be warranted. Therefore, in accordance with section 4(b)(3)(B) of the ESA and NMFS' implementing regulations (50 CFR 424.14(b)(2)), we will commence a review of the status of the species. During our status review, we will first determine whether one of the populations identified by the petitioners meets the DPS policy criteria, and if so, whether it is threatened or endangered throughout all or a significant portion of its range. We now initiate this review, and thus, the Northwest Atlantic population of the thorny skate is considered to be a candidate species (see 69 FR 19975; April 15, 2004). To the maximum extent practicable, within 12 months of the receipt of the petition (May 28, 2016), we will make a finding as to whether listing either of the populations identified by the petitioner as DPSs as endangered or threatened is warranted as required by section 4(b)(3)(B) of the ESA. If listing a DPS is found to be warranted, we will publish a proposed rule and solicit public comments before developing and publishing a final rule. The petitioners request that we designate critical habitat for thorny skates. ESA Section 4(a)(3)(A) and its implementing regulations state that, to the maximum extent prudent and determinable, the Secretary shall, concurrently with listing a species as endangered or threatened, designate any critical habitat for that species. If a thorny skate population were to be listed as a DPS, we would follow the relevant statutory and regulatory provisions regarding the designation of critical habitat.

### **Information Solicited**

To ensure that the status review is based on the best available scientific and commercial data, we are soliciting information on the thorny skate. Specifically, we solicit information in the following areas: (1) historical and current distribution and abundance of this species in the Northwest Atlantic; (2) historical and current population status and trends; (3) any current or planned activities that may adversely impact the species, especially as related to the five factors specified in section 4(a)(1) of the ESA and listed above; (4) ongoing efforts to protect and restore the species and its habitat; and (5) genetic data or other information related to possible population structure of thorny skate. We request that all information be accompanied by: (1) supporting documentation such as maps, bibliographic references, or reprints of pertinent publications; and (2) the submitter's name, address, and any association, institution, or business that the person represents.

### **References Cited**

A complete list of references is available upon request (see **ADDRESSES**).

**Authority**

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

Dated: October 16, 2015.

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Samuel D. Rauch, III.

Deputy Assistant Administrator for Regulatory Programs,

National Marine Fisheries Service.

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