DISPUTES (UTILITY CONTRACTS) (DATE)

The requirements of the Disputes clause at FAR 52.233–1 are supplemented to provide that matters involving the interpretation of tariffed retail rates, tariff rate schedules, and tariffed terms provided under this contract are subject to the jurisdiction and regulation of the utility rate commission having jurisdiction.

(End of clause)

[FR Doc. E9–11654 Filed 5–18–09; 8:45 am]

**BILLING CODE 6820–61–S**

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## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

### 50 CFR Part 17

**[FWS–R3–ES–2008–0030; 92210–1111–0000–FY09–B3]**

## Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To List the Coaster Brook Trout as Endangered

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Notice of 12-month petition finding.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to list the coaster brook trout (*Salvelinus fontinalis*) as endangered under the Endangered Species Act of 1973, as amended (Act). The petition also asked that critical habitat be designated for the species. After review of all available scientific and commercial information, we find that the coaster brook trout is not a listable entity under the Act, and therefore, listing is not warranted. We ask the public to continue to submit to us any new information that becomes available concerning the taxonomy, biology, ecology, and status of coaster brook trout and to support cooperative conservation of coaster brook trout within its historical range in the Great Lakes.

**DATES:** The finding announced in this document was made on May 19, 2009.

**ADDRESSES:** This finding is available on the Internet at *http://www.regulations.gov* at Docket Number [FWS–R3–ES–2008–0030]. Supporting documentation for this finding is available for inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Region 3 Fish and Wildlife Service Regional Office, 1 Federal Drive, Bishop Henry Whipple Federal Building, Fort Snelling, MN 55111. Please submit any new information, materials, comments, or questions concerning this finding to the above address, Attention: Coaster brook trout.

**FOR FURTHER INFORMATION CONTACT:** Jessica Hogrefe, Region 3 Fish and Wildlife Service Regional Office (*see* **ADDRESSES**) (telephone 612–713–5346; facsimile 612–713–5292). Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800–877–8339.

**SUPPLEMENTARY INFORMATION:**

### Background

Section 4(b)(3)(B) of the Act (16 U.S.C. 1531 *et seq.*) requires that, for any petition to revise the Lists of Endangered and Threatened Wildlife and Plants that contains substantial scientific and commercial information that listing may be warranted, we make a finding within 12 months of the date of our receipt of the petition on whether the petitioned action is: (a) Not warranted, (b) warranted, or (c) warranted, but the immediate proposal of a regulation implementing the petitioned action is precluded by other pending proposals to determine whether species are threatened or endangered, and expeditious progress is being made to add or remove qualified species from the List of Endangered and Threatened Species. Section 4(b)(3)(C) of the Act requires that we treat a petition for which the requested action is found to be warranted but precluded as though resubmitted on the date of such finding, that is, requiring that we make a subsequent finding within 12 months. Such 12-month findings must be published in the **Federal Register.** This notice constitutes our 12-month finding for the petition to list the U.S. population of coaster brook trout.

*Previous Federal Action*

The Sierra Club Mackinac Chapter, Huron Mountain Club, and Marvin J. Roberson filed a petition, dated February 22, 2006, with the Secretary of the Interior to list as endangered the ''naturally spawning anadromous (lake-run) coaster brook trout throughout its known historic range in the conterminous United States'' and to designate critical habitat under the Act. The petition clearly identified itself as such and included the requisite identification information for the petitioners, as required in 50 CFR 424.14(a). On behalf of the petitioners, Peter Kryn Dykema, Secretary of the Huron Mountain Club, submitted supplemental information, dated May 23, 2006, in support of the original petition. This supplemental information provided further information on the species' status and biology, particularly for brook trout in the Salmon Trout River.

On September 13, 2007, we received a 60-day notice of intent to sue over the Service's failure to determine, within 1 year of receiving the petition, whether the coaster brook trout warrants listing. Under section 4 of the Act, the Service is to make a finding, to the maximum extent practicable within 90 days of receiving a petition, that it does or does not present substantial scientific or commercial information indicating that the petitioned action may be warranted. Further, the Act requires that, within 12 months of receiving a petition found to present substantial information, the Service must determine whether the petitioned action is warranted. A complaint was filed in U.S. District Court in the District of Columbia on December 17, 2007, for failure to make a timely finding (*Sierra Club, et al.* v. *Kempthorne,* No. 1:07–cv–02261 (D.D.C. December 17, 2007)). The Service reached a negotiated settlement with the plaintiffs to submit the 90-day finding to the **Federal Register** by March 15, 2008. We published a ''substantial'' 90-day finding March 20, 2008. The negotiated settlement further required the Service to publish the 12-month finding in the **Federal Register** by December 15, 2008. The deadline for the 12-month finding was extended to April 15, 2009, by mutual consent. On April 15, 2009, we filed an unopposed motion to extend the deadline for the coaster brook trout 12-month finding to May 12, 2009.

*Species Information*

Species Description

Brook trout (*Salvelinus fontinalis*), also called brook char or speckled trout, is one of three species in the genus *Salvelinus* (chars) native to north and eastern North America; the others being lake trout (*S. namaycush*) and Arctic char (*S. alpinus*). The chars are a sub-group of fishes in the salmon and trout subfamily (Salmoninae) that is distinct from the ''true'' trout and salmon sub-groups.

The brook trout throughout its range in eastern North America exhibits considerable variation in growth rate, color, and other features, but generally can be distinguished from other char and trout species by its olive-green to dark brown back with a light yellow-brown vermiculate pattern, sides with large yellow-brown spots and blue halos surrounding small, sporadic red and orange spots. Pectoral, pelvic, anal, and lower caudal fin have leading edges of white bordered by black with the remainder predominantly reddish to orange. Sea-run brook trout become silver with purple iridescence and show red spots on the sides (Scott and Crossman 1973, p. 208).

Distribution

The historical range of native brook trout extends along Hudson Bay in Canada across the Provinces of Manitoba, Ontario and Quebec, to Newfoundland and Labrador and south to Nova Scotia and New Brunswick in Canada; and from eastern Iowa through northern Illinois, northern Ohio, and the Great Lakes drainage (Minnesota, Michigan, Wisconsin), through the New England States (New York, New Hampshire, Vermont, Maine, Massachusetts, Pennsylvania, New Jersey), large New England rivers (such as the Hudson River and Connecticut River), and through the Appalachian Mountains in Maryland, Virginia, West Virginia, North Carolina, South Carolina, Tennessee, south to Georgia (MacCrimmon and Campbell 1969, pp. 1700–1702; MacCrimmon *et al.* 1971, p. 452; Scott and Crossman 1973, pp. 209–210; Power 1980, p. 142). Naturalized populations of brook trout were established as early as the late 1800s beyond the historical native range by introductions to waters in western North America, South America, Eurasia, Africa, and New Zealand (MacCrimmon and Campbell 1969, p. 1699, pp. 1703–1717). The current range of native brook trout still extends through Canada and down to Georgia in the U.S., but in many locations, populations have been completely extirpated or have contracted within this range towards upper stream reaches, higher altitudes, or headwaters (EBJV 2006, p. 2).

Distribution of Brook Trout in the Great Lakes

According to Bailey and Smith (1981, p. 1549) and MacCrimmon and Campbell (1969, p. 1701), brook trout are native to the lakes and tributaries of Lakes Superior, Huron, Michigan, and the tributaries of Lakes Erie and Ontario. Brook trout are not believed to have been present in Minnesota streams above barrier falls to Lake Superior (Smith and Moyle 1944, p. 119) or throughout most of the lower peninsula of Michigan (MIDNR 2008a, pp. 1–2; MacCrimmon and Campbell 1969, p. 1704).

Habitat Requirements

Brook trout require clear, cold, well-oxygenated water to thrive. They are generally found in water ranging between 41–68° Fahrenheit (5–20° Celsius), with their likely preferred temperature falling near the middle of this range (Power 1980, p. 172). Thermal requirements within this range vary by life cycle phase and season (Scott and Crossman 1973, p. 211; Blanchfield and Ridgway 1997, p. 750; Baril and Magnan 2002, pp. 177–178).

The brook trout spawns in late summer or autumn, the date varying with latitude and temperature. Spawning takes place most often over gravel beds but may be successfully accomplished over a variety of substrates if there is spring upwelling or a moderate current (Scott and Crossman 1973, p. 210). Power (1980, p. 151) describes rangewide brook trout spawning, which occurs in the fall, when day length and temperature are decreasing. In northerly regions and at high elevations, brook trout may spawn as early as late August and spawning may be delayed until December in southern areas. As is typical for salmonids, females prepare redds (hollows scooped out for spawning) in suitable gravel substrate. The female then deposits her eggs in the redd where they are fertilized by a male. After spawning there is no further parental involvement with the young. The redd protects the eggs and allows an adequate exchange of dissolved gases and other materials during development.

Brook trout are carnivorous, feeding opportunistically upon a variety of prey, such as worms, leeches, crustaceans, aquatic insects, terrestrial insects, spiders, mollusks, and fish (Scott and Crossman 1973, p. 212). Anadromous (migrating from salt water to spawn in fresh water) forms vary their feeding behavior and prey items based on their age and the environment, marine or riverine, they are occupying (Newman and Dubois 1997, p. 9). Brook trout also show diverse foraging behaviors; some individuals may be sedentary, eating crustaceans from the lower portion of the water column, whereas others in the same system may be more active and eat insects from the upper portion of the water column (McLaughlin *et al.* 1999, p. 386). This resource polymorphism may play a supplementary role in the extensive adaptive radiation (evolution of ecological variability within a rapidly multiplying lineage; Smith and Skúlason 1996) observed in this species.

Genetics of Brook Trout

A large amount of genetic variation for brook trout is distributed among populations (large Fst values). This pattern is heavily influenced by the diverse ecological and life-history characteristics of brook trout populations (population connectivity or isolation, philopatric tendency). This pattern of highly differentiated populations of brook trout is found at small and large geographic scales. Population genetic structuring is common in brook trout throughout its range (Angers *et al.* 1999, pp. 1049–1050). Like many salmonids, brook trout tend to have a hierarchical population structure resulting from the hierarchical design of the networks of streams and lake or coastal areas in which they live, and a complicated life cycle that leads to strong local adaptations. Taxonomic resolution can be even more complicated at the lake level when lakes include sympatric (occupying the same or overlapping geographic area without interbreeding) but genetically divergent brook trout populations such as in Lake Mistassini in Canada (Fraser and Bernatchez 2008, p. 1197). This degree of genetic divergence that forms among populations is reflective of the reproductive connections (isolation) among the populations across the range of the taxon.

Six distinct genetic mitochondrial (mtDNA) clades have been identified throughout the range of brook trout in eastern North America (Danzmann *et al.* 1998, p. 1307). These mtDNA clades reflect historical isolation in glacial refugia or long periods of isolation in nonglacial areas in the southern part of the species' range. The Wisconsin glacial advance which covered portions of Canada covered all five Great Lakes 15,000 years ago (Bailey and Smith 1981, p. 1543). As these glaciers receded, brook trout recolonized the lakes from the Mississippi and Atlantic refugia (Danzmann *et al.* 1998, pp. 1308, 1312). Given this pattern of glaciation, genetic diversity is greatest at the southern portion of the species' range and gradually decreases northward (Danzmann *et al.* 1998, pp. 1310–1311). As the most geographically isolated (for tens of thousands of years), brook trout in the southern part of the species' range (along the Appalachian Mountains south to Georgia) are the most diverse, containing all six mtDNA clades. The Great Lakes contains three of the six mtDNA clades. Throughout the northern portion of their range in Canada, brook trout are the least genetically diverse, with only a single mtDNA clade present. Within each of these lineages, there is evidence to suggest that selection is driving rapid phenotypic divergence in some populations.

Results based on microsatellite DNA variation identified nine distinct genetic assemblages of brook trout in the U.S. (King 2009, unpub. data). Assemblages from the nonglacial southern part of the species' range (along the Appalachian Mountains from Pennsylvania to Georgia) in the U.S. are the most genetically divergent, and this divergence among the assemblages generally decreases as the range progresses northward.

Genetics of Brook Trout in the Great Lakes

Populations from Lake Superior and tributaries to Lake Erie form two of the nine genetic assemblages of brook trout in the U.S. The Lake Erie populations are the most divergent assemblage from the northern part of the species' range. Lake Superior populations are similar in the degree of genetic divergence to the remaining northern assemblages grouping with the average genetic distance between brook trout populations in the U.S. Samples from the rest of the Great Lakes were not available for analysis. Although brook trout in the Great Lakes do not contain any wholly unique mtDNA clades, they do contain a large amount of the genetic variation in a confined portion of the range (Danzmann *et al.* 1998, pp. 1310–1311).

Native populations of brook trout in Lake Superior in most cases have retained their native genetic characteristics despite the stocking of hatchery fish from sources outside and within the Lake Superior basin. In Lake Superior, the intensity and purpose of stocking has varied over time and space. For example, Minnesota tributaries to Lake Superior have been stocked with hatchery strains that originated from outside of the Great Lakes Basin to provide fishing opportunities above fish passage barriers (Wilson *et al.* 2008, p. 1312). Until the early 1990s, most of the stocked fish in Lake Superior were domesticated strains from outside the Great Lakes basin (Schreiner *et al.* 2008, p. 1357), although many stocking events were undocumented and records of early stocking events are incomplete (Wilson *et al.* 2008, p. 1312). These stocking efforts were not targeted at rehabilitation and from that perspective, results were poor. The stocked fish were not behaviorally or evolutionarily adapted to the environment in which they were planted, criteria known to limit survival and reproductive success (Schreiner *et al.* 2008, p. 1357). Burnham-Curtis (2001, p. 2) concluded that hatchery fish have had little reproductive success in Lake Superior streams based on her examination of 36 tributaries to Lake Superior and 9 hatchery stocks outplanted into the lake. However, the genetic methods used by Burnham-Curtis provided low power to detect genetic introgression of hatchery fish into native populations (Wilson *et al.* 2008, p. 1312). A recent study by D'Amelio and Wilson (2008, p. 1215) used genetic methods with high power to detect genetic introgression of hatchery fish into natural populations. This study documented only low levels of genetic introgression of Lake Nipigon hatchery fish into native populations of brook trout from six tributaries to Lake Superior's Nipigon Bay (D'Amelio and Wilson 2008, p. 1222), despite decades of stocking. A study by Scribner *et al.* (2006, pp. 3–4) examined nine brook trout populations from Lake Superior tributaries on the south shore of Michigan and four hatchery strains outplanted into those tributaries. This study used similar methods to D'Amelio and Wilson (2008). Scribner *et al.* (2006, p. 8) concluded that hatchery stocking appears to have minimal if any impact of on brook trout.

Brook Trout Life-History Diversity

An individual's ability to produce multiple phenotypes (visible or observable characteristics) in response to its environment is termed phenotypic plasticity (Scheiner 1993, p. 36). Recent studies have recognized the role of phenotypic plasticity as a major source of phenotypic variation in natural populations (Price *et al.* 2003, p. 1438). The brook trout exhibits remarkable phenotypic plasticity across its natural range. This plasticity allows it to thrive in a variety of environments, from cold subarctic regions, through temperate zones and in southern refugia in eastern North America, and in a range of places where it has been introduced (Power 1980, p. 142). Although primarily a stream-dwelling species, brook trout also occupy inland lakes and coastal waters. Because of the variety of the freshwater, estuary, and ocean environments, migratory plasticity is also favored. The brook trout's dispersal subsequent to receding glaciation, and separation into isolated breeding stocks in diverse habitats subject to an array of natural and man-made influences have all contributed to this variability (Power 1980, p. 142).

Brook trout display considerable life-history variation throughout their native range (Huckins and Baker 2008, p. 1229). Brook trout across its range exhibit a variety of life-history types (polymorphisms or ecotypes), including fluvial (stream-dwelling), adfluvial (migrating between lakes and streams), lacustrine (lake-dwelling), and anadromous (migrating from salt water to spawn in fresh water) forms. Understanding life-history diversity in a species requires knowledge of the evolutionary history, ecological setting, and reproductive relationships among ecotypes. Reproductive interactions between ecotypes are reflected by the magnitude and pattern of genetic differentiation observed between life-history phenotypes at neutral genetic markers. The expression of migratory behavior (expressed as the adfluvial and anadromous ecotypes) by any individual fish will be partially in direct response to its environment. Phenotypic expression of more than one form may be expected in a population located in a variable environment containing habitats for several ecotypes. The amount of phenotypic plasticity a population will exhibit for the migratory trait also has a heritable genetic basis and will be determined by the intensity and type of selective pressures that population experiences (Via and Lande 1985, pp. 517–519; Theriault *et al.* 2008, pp. 418–419).

Adoption of migratory adfluvial form or stream-resident life-history form in brook trout has been modeled under a conditional strategy framework where environmentally influenced threshold traits determine which ecotype a fish will adopt (Hendry *et al.* 2004, pp. 124–125). Growth rate efficiencies, body size, and concentration of juvenile hormone have all been identified as potential threshold traits (Theriault and Dodson 2003, pp. 1155–1157). Theoretical work by Ridgway (2008, p. 1185) and Uller (2008, pp. 436–437) also provide information to suggest parental effects are important to the expression of alternate ecotypes of brook trout. These parental effects describe an affect of the parental phenotype on the offspring's phenotype such as coaster females producing larger eggs and spawning in different locations from stream-resident ecotypes, influencing the habitat use (Morinville and Rasmussen 2006, pp. 701–702) and growth rate at the juvenile stage (Perry *et al.* 2005, p. 1358). These differences in growth rate and habitat use impact potential threshold traits.

Work on sympatric brook trout life forms at young ages largely comes from a few studies on anadromous populations. Morinville and Rasmussen (2003) studied the bioenergetics of young brook trout exhibiting anadromous migratory and stream-resident life tactics. They found that the anadromous migrants have higher metabolic costs and had consumption rates 1.4 times that of stream residents but growth efficiencies of the anadromous form were lower than that of residents. Spatial utilization of habitat differed among the life tactics as well, with migratory individuals occupying faster-flowing waters compared to the resident fish which used pool areas (p. 408). They concluded that migrant brook trout have noticeably different energy budgets than resident brook trout from the same system (p. 406). Morinville and Rasmussen (2008) also investigated morphological differences between life tactics. The authors concluded that migrant brook trout were found to be more streamlined (narrower and shallower bodies) than resident brook trout, and these differences persisted into the marine life of the migrant fish (pp. 175, 183). The differences were powerful enough to derive discriminant functions using five of the measured traits allowing for accurate classification of juvenile brook trout as either migrant or resident with an overall correct classification rate of 87 percent.

A study by Theriault *et al.* (2007b, p. 61) found that sympatric anadromous and fluvial brook trout in the Sainte-Marguerite River in Quebec belonged to a single gene pool. Phenotypic plasticity is, therefore, a major force driving the expression of these two life histories from this population. Evolution of phenotypic plasticity in this population was influenced by mating systems with most of the mating between different morphotypes occurring between fluvial males and anadromous females. Additional work in this system demonstrated significant heritability for life-history tactic and for body size (Theriault *et al.* 2007a, pp. 7–8) indicating expression of life-history tactic in this population can be effected by natural or artificial selection.

Life-History Diversity in Great Lakes Brook Trout

Fish that complete their life cycle exclusively in tributaries to the Great Lakes exhibit the fluvial life history and are defined as stream residents. ''Coaster'' (the subject of the petition) is a regional term for a life-history variant of brook trout in the Great Lakes (Burnham-Curtis 2001, p. 2; Wilson *et al.* 2008, p. 1) which use lake waters of the Great Lakes for all or a portion of its life cycle (Becker 1983, p. 320). The coaster form can be further divided into an adfluvial ecotype that migrates from the stream to the lake and back into tributaries to spawn and a lacustrine ecotype that completes its life cycle entirely within the lake (Huckins *et al.* 2008, p. 1323). In the Great Lakes region, spawning usually occurs from mid-September through mid-November. Distinct life histories associated with the coaster and stream-resident types result in different physical, demographic, and ecological characteristics for the forms (Huckins *et al.* 2008, p. 1337; Huckins and Baker 2008, p. 1241; Ridgway 2008, p. 1185). Specifically, coasters tend to live longer than stream residents (5–8 years versus less than 5 years), reach maturation later (females at 2–4 years versus 1–2 years), attain larger length and weight as adults (12–25 inches and 0.75–8 pounds (30–64 centimeters (cm) and 341–3632 grams (g)) versus (5–15 inches (13–38 cm) and (less than 1 pound (<454 g), be more fecund (1500–3000 eggs per female versus 100–1500 eggs per female), and move greater distances (up to 19–217 miles (30–350 kilometers (km)) versus less than 19 miles (30 km)) (Scott and Crossman 1973, pp. 208, 210, 211; Power 1980, p. 157; Becker 1983, pp. 318, 320; Ritchie and Black 1988, pp. 19, 50, 51; Quinlan 1999, pp. 11, 12, 14, 16, 17, 20; Swainson 2001, pp. 40, 41, 60, 64; WIDNR and USFWS 2005, p. 16; Huckins and Baker 2008, pp. 1239, 1241; Huckins *et al.* 2008, pp. 1328, 1329, 1337; Mucha and Mackereth 2008, p. 1210; Schram 2008a, pers. comm.; Chase 2008, pers. comm.).

Coasters have been historically documented in Lakes Superior, Huron, and Michigan brook trout populations (Bailey and Smith 1981, p. 1549; Dehring and Krueger 1985, p. 1; Enterline 2000, p. 1; MIDNR 2008a, pp. 1–2). However, Lake Superior is the only Great Lake with extant coaster forms of brook trout, and all available literature is from this area. Coasters in the Great Lakes are found in Canada and the U.S. in substantially fewer locations than they were historically (Newman *et al.* 2003, p. 39). Populations in the Great Lakes basin with these life-history forms are documented within Canada in tributaries to Nipigon and Black Bays, the Nipigon River, Lake Nipigon and the Pancake River in the eastern part of Lake Superior (Newman *et al.* 2003, p. 39; Chase and Swainson 2009, pers. comm.). Within the U.S. portion of the Great Lakes basin, populations that express the coaster form occur in Isle Royale National Park in Tobin Harbor, Big and Little Siskiwit Rivers, and Washington Creek as well as on the south shore of Lake Superior in the Salmon Trout River (Newman *et al.* 2003, p. 39).

As previously stated, brook trout populations within the upper Great Lakes exhibit fluvial, adfluvial, and lacustrine life-history forms, coasters comprising the latter two forms. Populations of brook trout in Lake Superior likely function as types of metapopulations, with the coaster life forms serving as dispersers (D'Amelio and Wilson 2008, p. 1222; Sloss *et al.* 2008, p. 1249). The viability of a metapopulation is strongly contingent upon maintaining dispersal among populations. Although brook trout exhibit spawning site fidelity, individuals exhibiting the adfluvial life forms in Lake Superior have also been shown to stray or disperse among streams (D'Amelio and Wilson 2008, p. 1222; Mucha and Mackereth, p. 1211). The long-term persistence of a metapopulation requires a balance between local extinction and recolonization of constituent populations (*see* Hanski 1998 for a review of metapopulations). Dispersing individuals offset local population extinction by providing a means for recolonization (Brown and Kodric-Brown 1977, p. 448; Reeves *et al.* 1995, p. 340). Dispersing individuals also provide for gene flow among discrete populations, countering losses of genetic fitness while still allowing the development and distribution of unique adaptive traits (Ingvarsson 2001, p. 63; Tallmon *et al.* 2004, p. 494). Thus, the coaster life-history forms are important to the long-term viability of brook trout populations throughout Lake Superior.

Genetic studies of stream-resident (fluvial life form) brook trout show substantial genetic structuring among populations in Michigan, Wisconsin, Minnesota, and Canada characterized by distinct regional groupings or metapopulations (Burnham-Curtis 1996, pp. 10–11; Burnham-Curtis 2001, p. 10; Sloss *et al.* 2008, p. 1249; Wilson *et al.* 2008, p. 1312; Scribner *et al.* 2008, p. 9). In studies aimed at determining genetic differences between the coaster polymorphism and stream-resident fish occupying tributaries connected to the lake, molecular genetic work in Lake Superior indicates that coasters and stream-resident brook trout occupying tributaries to the first barrier are parts of the same population (D'Amelio and Wilson. 2008, p. 1221; Scribner *et al.* 2008, p. 9; Stott 2008, p. 5). Work investigating the genetic differences of various tributaries to the lake found distinct differences among populations of brook trout in each tributary to Lake Superior (Burnham-Curtis 1996, p. 10; Burnham-Curtis 2000, p. 7; Burnham-Curtis 2001, p. 10; D'Amelio and Wilson 2008, p. 1222; Sloss *et al.* 2008, p. 1249; Scribner *et al.* 2008, p. 9). Within Lake Superior, regional genetic differences are evident between brook trout populations in Nipigon Bay, Isle Royale, and Lake Nipigon-Grand Portage (Wilson *et al.* 2008, p. 1313). Adfluvial brook trout are thought to be the mechanism providing genetic communication among these regional aggregations and straying of a coaster was documented in Nipigon Bay and at Isle Royale (D'Amelio *et al.* 2008, p. 1347; Stott 2008, p. 4). Sloss *et al.* (2008) investigated genetic differentiation among four Wisconsin populations of stream-resident brook trout. His work found significant differentiation among populations to the point the authors observed that for these populations, there appears to be a near complete lack of gene flow among them resulting in genetic drift (Sloss *et al.* 2008, p. 1249). None of these isolated populations are thought to currently have adfluvial ecotypes as part of the population. This observation is consistent with the contemporary lack of an adfluvial form that historically provided the regional genetic connection for the three metapopulations previously mentioned.

As characterized in the entire brook trout species, phenotypic plasticity and adaptive radiation (Schluter 2000, p. 1) appear to represent the continuum of evolutionary processes underlying the expression of life-history variation in populations of brook trout in Lake Superior (Ardren 2008, pp. 1–2). As stated above, plastic responses allow individuals to obtain high fitness in new environments. Alternatively, adaptive genetic differentiation among populations may provide evolutionary advantages. First, there are fitness costs to being highly plastic. For example, plastic genotypes need to maintain sensory and developmental pathways in order to induce plastic responses that are not required by nonplastic genotypes (Relyea 2002, pp. 272–273). Secondly, if the plastic response to a new environment is insufficient and directional selection favors an extreme phenotype, there will be genetic evolution of the trait (adaptive radiation). Therefore, if a population of brook trout experiences divergent selection in stable environments, we would expect the ecotypes to evolve genetic differences and nonplastic forms because the cost of maintaining the phenotypic plasticity would be too high. Findings in the Salmon Trout River indicate phenotypic plasticity plays a major role in the expression of the adfluvial and fluvial ecotypes while information from Isle Royale indicates adaptive radiation has occurred separating adfluvial and lacustrine coaster ecotypes. Migratory plasticity could be favored in situations where adfluvial and stream-resident brook trout co-occur because the environments they occupy are highly variable (Huckins *et al.* 2008, p. 1324; Ridgway 2008, pp. 1186–1187). The alternating selection patterns associated with these diverse and variable environments create a fitness advantage for plastic genotypes over nonplastic genotypes. In addition, the metapopulation structure mediated by coaster brook trout (D'Amelio and Wilson 2008, p. 1222; Ridgway 2008, p. 1181) favors plasticity over adaptive genetic differences among populations because dispersal among populations increases environmental heterogeneity and favors an increase in trait reaction norm (the pattern of visible characteristics produced by a given genetic makeup of an organism under different environmental conditions; Sultan and Spencer 2002, p. 281). Alternatively, the adfluvial and lacustrine ecotypes on Isle Royale are physically isolated and in this situation, adaptive radiation would be favored over the evolution of phenotypic plasticity (Price 2003, pp. 1437–1438).

If phenotypic plasticity is the source of differences observed between stream-resident and brook trout, then these ecotypes are expressed in a single population and represent the extremes of the reaction norm for migratory behavior. Scribner *et al.* (2008, p. 10) did not observe genetic differences between sympatric adfluvial brook trout and presumed stream-resident ecotypes in the Salmon Trout River on the south shore of Lake Superior. Analysis of microsatellite DNA provided high statistical power to detect genetic differences between ecotypes. In fact, the authors did observe highly significant genetic differences between brook trout sampled above and below the impassable waterfall in this system. In addition, when collections from the Salmon Trout River were compared with native brook trout populations sampled from 10 other nearby tributaries, the lowest pairwise measure of genetic distinction was observed between the resident and adfluvial ecotypes sampled below the waterfall in the Salmon Trout River. D'Amelio and Wilson (2008, p. 1221) used similar methods to document that adfluvial brook trout in the Nipigon Bay were not genetically distinct from presumed resident brook trout sampled from tributaries to the bay. These findings in the Salmon Trout River and the Nipigon Bay area indicate phenotypic plasticity likely plays a major role in the expression of the adfluvial and fluvial ecotypes.

Theriault *et al.* (2008, pp. 417–419) used an eco-genetic model to demonstrate that intensive harvest of anadromous fish reduces the probability of migration in brook trout over the course of 100 years. This study provides a basic framework for understanding how fisheries-induced selection (mortality from fishing) influences the evolution of alternate life-history tactics that are expressed by phenotypic plasticity. For example, directional selection imposed by fishing-induced mortality on coaster brook trout confers high fitness to the survivors of the fishery but not necessarily with respect to natural selection. There is also uncertainty regarding the rate of recovery for expression of the adfluvial form after fishing selection is reduced or eliminated because there is not automatically equal directional selection in the opposite direction for expression of the adfluvial form. In the case of the coaster, habitat degradation and competition from nonnative salmon may exclude brook trout from habitats that would allow juvenile brook trout to achieve growth rates necessary to express the adfluvial coaster ecotype (Huckins *et al.* 2008, pp. 1337–1339). Additionally, metapopulation structure mediated by coaster brook trout (D'Amelio *et al.* 2008, p. 1348) favors plasticity over adaptive genetic differences among populations (Sultan and Spencer 2002, p. 281). Loss of coasters in most populations in Lake Superior has reduced migration among populations (Sloss *et al.* 2008, p. 1249) resulting in a reduction in environmental heterogeneity favoring a decrease in the reaction norm of traits. These studies demonstrate that human-induced selective forces can alter the reaction norm for a population which can result in the loss of plasticity needed to express the coaster life-history forms.

Brook trout experts contend that if environmental conditions are suitable (*i.e.,* threats are abated), the adfluvial life form of brook trout populations in Lake Superior can be readily reconstituted from purely resident stock (USFWS 2009, p. 8); this is believed unlikely for other salmonids (*e.g., Oncorhynchus mykiss*). This assertion is predicated on three premises. First, adult brook trout of one ecotype may produce offspring of the other ecotype. For example, two resident fish could breed and produce offspring that exhibit both the adfluvial and fluvial life-history strategies. Further, stream-resident and adfluvial ecotypes from the same population interbreed. This means that within a stream, individuals that exhibit the resident and adfluvial forms reside within and are drawn from the same population. Second, the chars (genus *Salvelinus*), including brook trout, show greater phenotypic plasticity than most other salmonids. Adfluvial brook trout do not require substantial physiological changes (for example, smoltification) to successfully migrate and survive in the lake environment. Thus, the fitness costs to maintain the genetic code for plasticity are likely less relative to saltwater-dwelling salmonids. Hence, it is reasonable to expect a brook trout population will maintain the ability (genetic code) to express the full array of life forms over time. Third, life-history strategy for brook trout is strongly controlled by environmental conditions or triggers. As such, the experts believe that, provided the necessary environmental conditions or triggers exist, life forms can be expressed even if temporally lost from a population.

Current Population Status of Brook Trout

The current range of native brook trout remains generally unchanged, extending through much of eastern North America, from eastern Canada, south through the Great Lakes and northeast to Georgia in the U.S. However, populations throughout this range have experienced significant declines. The current range of native brook trout started diminishing over the past 200 years as a result of ecosystem disruption following European settlement of North America (Newman and DuBois 1997). Habitat destruction by forestry, agricultural practices, industrial water use, dams, and pollution were responsible for this decline (Power 1980, p. 141). Brook trout were once present in nearly every coldwater stream and river in the eastern U.S. and Canada, but populations began to disappear as early agriculture, timber, and textile practices and industries cleared the region's protective forests and degraded the streams with sediment and pollution (Power 1980, p. 141; EBJV 2006, p. 1).

Throughout much of their natural range, remaining stream populations have retreated into extreme headwater, high elevation, or upstream reaches (EBJV 2006, p. 2). In the eastern U.S., healthy stream populations of brook trout (wild brook trout occupying 90–100 percent of their historical habitat) exist in only 5 percent of subwatersheds (EBJV 2006, p. 2). Anadromous stocks along the U.S. coast and in many Canadian rivers have been decimated by dams and estuarine pollution (Power 1980, p. 195). In the southern portion of its range (southern Appalachian Mountains), brook trout populations have declined by 75 percent, persisting now only in isolated headwater reaches (EBJV 2006, p. 6).

Various threats are persistent across the brook trout range. Most of them involve habitat loss and degradation, such as poor land management, high water temperature, sedimentation (roads), urbanization, degraded riparian habitat, stream fragmentation (roads), dam inundation/fragmentation, and forestry practices (EBJV 2006, pp. 3, 5). Poor land management associated with agriculture (such as clearing streamside vegetation, over-grazing sensitive areas, ineffectively managing nutrients, and ditching small streams) ranks as the most widely distributed impact to brook trout across the eastern U.S. (EBJV 2006, p. 2). Climate change presents a significant threat to brook trout, with some southern portions predicted to lose between 53–97 percent of their brook trout habitat due to high water temperatures (Flebbe 2006, p. 1379). While some uncertainty remains about the exact temperature increase that will result from climate change, the present range of brook trout is predicted to shrink, particularly in the southern Appalachians (Hudy *et al.* 2005, p. 5). Nonnative species are now present throughout most of the range (Parsons 1973, p. 5). Interactions with these nonnatives are considered to be among the most significant biological threats to brook trout rangewide (Peck 2001, p.13; Hudy *et al.* 2005, p. 3; EBJV 2006, pp. 2–3, 5). Brown trout have been shown to displace or reduce stream populations of brook trout throughout their natural range (Nyman 1970, p. 348; Fausch and White 1981, p. 1226; Waters 1983, p. 144). Encroachment by rainbow trout has also been documented in the contraction of the range of native brook trout across their native range (Kelly *et al.,* 1980, pp. 9–10; Power 1980, p. 195; Larson and Moore 1985, p. 200). Species such as small mouth bass and yellow perch are considered to be significant competitors with lake-dwelling brook trout (EBJV 2006, pp. 22, 28, 34).

Current Population Status of Brook Trout in the Upper Great Lakes

Brook trout populations throughout the upper Great Lakes region are relatively common and geographically widespread, although distribution and abundance is much reduced from historical levels (Power 1980, p. 195; Becker 1983, pp. 321–322; WIDNR and USFWS 2005, p. 17). Dramatic declines in abundance and distribution of both coaster and stream-resident ecotypes of brook trout occurred in the upper Great Lakes from the 1850s to mid-1900s (Goodier 1982, pp. 110, 112; Ritchie and Black 1988, p. 15; Newman and Dubois 1997, pp. 4–6; Enterline 2000, p. 1; WIDNR and USFWS 2005, pp. 17–18; Schreiner *et al.* 2008, p. 1305; Schreiner *et al.* 2008, p. 1351; Huckins *et al.* 2008, p. 1322).

There are presently at least 200 streams with documented brook trout populations in the upper Great Lakes (Moore and Bream 1965, p. 19; Goodier 1982, p. 110; Enterline 2000, p. 30; Newman *et al.* 2003, pp. 31–37; Quinlan 2004, unpub. data; Bassett 2009, unpub. data; Ward 2007, p. 16; Schram 2008b, pers. comm.; Scott 2008, pers. comm.; Chase 2009, pers. comm.; OMNR 2009, unpub. data). The current specific status of most of these populations is not known, but they are described by the Michigan, Minnesota, and Wisconsin natural resource agencies as stable and self-sustaining in the upper Great Lakes (Holtz 2008, p. 2; MIDNR 2008a, p. 49; Schreiner and Ebbers 2008, pers. comm.).

In coldwater tributaries to the upper Great Lakes, brook trout were historically distributed from the river mouth upstream to the headwaters or to impassible barriers (Smith and Moyle 1944, p. 119; Moore and Braem 1965, p. 19; Goodier 1982, p. 111; Becker 1983, p. 321; WIDNR and USFWS 2005). The brook trout numbers in these stream reaches once numbered in the hundreds to thousands (Huckins and Baker 2008, p. 1231). A 30-year data set from Wisconsin tributaries shows that, in streams historically occupied solely by brook trout, brook trout have contracted into upstream sections and are now nearly absent in lower reaches (WIDNR 2008, unpub. data). Brook trout abundance has declined despite the persistence of suitable conditions for brook trout and high numbers of juvenile nonnative salmonids (WIDNR 2008, unpub. data). In Wisconsin tributaries to Lake Superior, the distribution of stream-resident brook trout populations has declined by nearly 50 percent from historical levels (WIDNR and USFWS 2005, p. 17).

Historically, 119 tributaries to Lake Superior and purportedly 6 Lake Huron streams supported populations of brook trout with coaster ecotypes (Newman *et al.* 2003, pp. 31–38; Enterline 2000, p. 30). Once abundant and widespread throughout the northern portions of the Great Lakes, populations of brook trout that still exhibit the coaster ecotypes are presently limited to a few locations (Dehring and Krueger 1985, p. 1; Bailey and Smith 1981, p. 1549; Goodyear *et al.* 1982, pp. 63–65; Enterline 2000, p. 30; Newman *et al.* 2003, p. 39; Schreiner *et al.* 2008, p. 1351; Mucha and Mackereth 2008, p. 1). Although self-sustaining populations of stream-resident brook trout are currently present in 56 of 58 U.S. streams and in all 61 Canadian streams identified in the *Brook Trout Rehabilitation Plan for Lake Superior* as historically supporting populations with coaster ecotypes (Newman *et al.* 2003, pp. 31–37; Quinlan 2008, unpub. data; Schreiner 2008, pers. comm.; Schram 2008c, pers. comm.; Scott 2008, pers. comm.; Chase 2009, pers. comm.), only 18 populations with coaster ecotypes still persist there (15 stream-spawning–adfluvial, and 3 lake-spawning–lacustrine) (Goodyear 1982, pp. 63–65; Quinlan 1999, p. 19; Ritchie and Black

1988, p. 15; Swainson 2001, p. 41; Newman *et al.* 2003, pp. 28–39; Enterline 2000, p. 30; Chase 2009, pers. comm.).

Over the last decade, the presence of coaster brook trout has been confirmed in other locations within the upper Great Lakes. Surveys, and in some cases genetic analysis, have confirmed the presence of brook trout with coaster ecotypes in the following locations; Minnesota tributaries to Lake Superior (Newman *et al.* 1999, p. 2; Burnham-Curtis 2000, p. 4; Pranckus and Ostazeski 2003, p. 5; Ward 2007, p. 16), three Michigan tributaries to Lake Superior (Stimmel 2006, p. 56; MIDNR 2008a, p. 2; Leonard 2009, pers. comm.), along the shoreline of the Red Cliff Indian Reservation, Wisconsin (Stott and Quinlan 2008, p. 21), and in Little Todd Harbor and Rock Harbor, Isle Royale (Gorman *et al.* 2008, p. 1257). The origin of these fish is unknown and natural reproduction of fish exhibiting the coaster ecotype has not been confirmed, therefore these locations are not identified as supporting self-sustaining populations. However, they have potential to be self-sustaining populations, as outlined by Schreiner *et al.* (2008).

Abundance of individuals in populations exhibiting the coaster ecotypes is stable or increasing in several regions of Lake Superior. In the Salmon Trout River, Michigan, abundance as determined by video surveillance increased from 118 to 243 in the period from 2004 to 2006 (MIDNR 2008a, p. 6). In the Nipigon River, angler catch per hour has increased from the late 1980s to the present, while harvest has decreased substantially (Houle 2004, p. 13). In South Bay, Lake Nipigon, estimates of spawner abundance continue to increase and currently number about 600 fish—up from fewer than 100 in the recent past, but still fewer than the estimated 2,500 present in the mid-1900s (Swainson 2009, pers. comm.). In Tobin Harbor, Isle Royale National Park, Michigan, estimates of adult brook trout from 1996, 2001, and 2008 has remained around 200–250 fish (USFWS unpublished data). Relative abundance based on shoreline electrofishing index surveys in Tobin Harbor from 1997 to 2008 has fluctuated from 0.3 per hour to 16.7 per hour (USFWS 2008, unpub. data).

There are reintroduction stocking efforts ongoing in several streams on the Grand Portage Indian Reservation (Newman and Johnson 1996, p. 4), Red Cliff Indian Reservation, Keweenaw Bay Indian Community Reservation (Donofrio 2002, p. 1), and in Whittlesey Creek, Wisconsin (USFWS and WIDNR 2003, p. 5). Supplementation stocking occurred in Siskiwit Bay, Isle Royale, from 1999 to 2005. Data collected to date indicates limited success with these efforts (Newman *et al.* 1999, p. 2; Quinlan 2008, pers. comm.; Stott and Quinlan 2008, p. 22). Reintroduction efforts in Michigan have recently been terminated in the Gratiot, Little Carp, Hurricane, and Mosquito Rivers and Sevenmile Creek (Scott 2007, pers. comm.; Loope 2007, pers. comm.).

Threats to brook trout across its native range are also acting on brook trout within the upper Great Lakes. A primary impact is the presence of introduced fishes (*e.g.,* non-native salmonids). Introduced salmonids have competitive and predatory impacts on brook trout, although the precise mechanisms may not be fully understood and the magnitude of impact may vary by species, population size, and environmental conditions. The decline or loss of the migratory coaster form has diminished connectivity among populations that once operated as metapopulations. Populations that occur in such isolated patches can be lost, increasing the possibility of extirpation. As a species, brook trout are known to be highly susceptible to exploitation by anglers (Newman and Dubois 1996, p. 3; Newman *et al.* 2003, p. 11; Huckins *et al.* 2008, p. 1322). Overharvest was a primary cause of the decline of Great Lakes brook trout populations by the early 1900s, especially the coaster ecotype, and continues to threaten some populations within the region (Newman and Dubois 1996, p. 1; Huckins *et al.* 2008, p. 1322; Schreiner *et al.* 2008, p. 1356). Climate change also presents a threat to upper Great Lakes brook trout, through increased water temperatures, leading to increased presence of nonnative competitors and predators along with a decrease in habitat suitability. Although the enormous coldwater reservoir within the lake environment represents a potential refuge for Great Lakes brook trout, predicted impacts in both stream and lake environments still represent a potential threat to their long-term viability.

## Defining a Species Under the Act

Section 3(16) of the Act defines ''species'' to include ''any species or subspecies of fish and wildlife or plants, and any distinct vertebrate population segment of fish or wildlife that interbreeds when mature'' (16 U.S.C. 1532 (16)). Our implementing regulations at 50 CFR 424.02 provide further guidance for determining whether a particular taxon or population is a species or subspecies for the purposes of the Act: ''The Secretary shall rely on standard taxonomic distinctions and the biological expertise of the Department and the scientific community concerning the relevant taxonomic group'' (50 CFR 424.11). As previously discussed, coaster brook trout are classified as *Salvelinus fontinalis,* the same as other brook trout, and as such we do not consider the coaster form of the brook trout to constitute a distinct species or subspecies. Since the coaster brook trout is not a distinct species or subspecies, we then evaluated whether the coaster brook trout is a distinct vertebrate population segment to determine whether it would constitute a listable entity under the Act.

To interpret and implement the distinct vertebrate population segment (DPS) provisions of the Act and Congressional guidance, the Service and the National Marine Fisheries Service (now the National Oceanic and Atmospheric Administration—Fisheries), published the *Policy Regarding the Recognition of Distinct Vertebrate Population Segments* (DPS Policy) in the **Federal Register** on February 7, 1996 (61 FR 4722). Under the DPS Policy, three elements are considered in the decision regarding the establishment and classification of a population of a vertebrate species as a possible DPS. These are applied similarly for additions to and removals from the List of Endangered and Threatened Wildlife and Plants. These elements are (1) the discreteness of a population in relation to the remainder of the species to which it belongs, (2) the significance of the population segment to the species to which it belongs, and (3) the population segment's conservation status in relation to the Act's standards for listing, delisting, or reclassification.

## Distinct Vertebrate Population Segment Analysis

In accordance with our DPS Policy, this section details our analysis of the first two elements used to assess whether a vertebrate population segment under consideration for listing may qualify as a DPS. These elements are (1) the population segment's discreteness from the remainder of the species to which it belongs and (2) the significance of the population segment to the species to which it belongs. Discreteness refers to the ability to circumscribe a population segment from other members of the taxon based on either (1) physical, physiological, ecological, or behavioral factors or (2) international boundaries that result in significant differences in control of exploitation, habitat management, conservation status, or regulatory mechanisms in light of section 4(a)(1)(B) of the Act.

Under our DPS Policy, if we have determined that a vertebrate population segment is discrete, we consider its biological and ecological significance to the larger taxon to which it belongs in light of Congressional guidance (*see* Senate Report 151, 96th Congress, 1st Session) that the authority to list DPSs be used ''sparingly'' while encouraging the conservation of genetic diversity. To evaluate whether a discrete vertebrate population may be significant to the taxon to which it belongs, we consider the best available scientific evidence. This evaluation may include, but is not limited to: (1) Evidence of the persistence of the discrete population segment in an ecological setting that is unusual or unique for the taxon; (2) evidence that loss of the population segment would result in a significant gap in the range of the taxon; (3) evidence that the population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historical range; and (4) evidence that the discrete population segment differs markedly in its genetic characteristics from other populations of the species.

The first step in our DPS analysis was to identify population segments of the brook trout to evaluate. The petition asked us to (1) ''list as 'endangered' the naturally spawning anadromous (lake-run) Coaster Brook Trout (*Salvelinus fontinalis*) throughout its known historic range in the conterminous United States'' (including designation of critical habitat) and (2) ''determine whether the Salmon Trout River (STR) coaster is a DPS'' and (3) ''whether the south shore of Lake Superior population of coasters (which are known to breed today only in the STR) is 'endangered.' '' Although brook trout in the Great Lakes exhibit three life-history forms (fluvial, adfluvial, and lacustrine), the petition specifically focused on the coaster, or adfluvial and lacustrine, forms.

To address the entity identified in the first petition request (coaster brook trout throughout their historical range in the U.S.), we identified two approaches to analyzing a potential population segment: (1) Describe and analyze an upper Great Lakes ''all brook trout'' population segment, which includes all brook trout life forms—fluvial, adfluvial, and lacustrine ecotypes, inclusive of coaster brook trout—present throughout the documented historical range of brook trout in the Great Lakes basin, and (2) describe and analyze an upper Great Lakes ''coaster-only'' population segment, which includes only the coaster forms—adfluvial and lacustrine ecotypes—of brook trout throughout the documented historical range of brook trout in the Great Lakes basin.

We find that neither of the population segments analyzed constitute a valid DPS, and therefore the first petitioned entity, coaster brook trout throughout their historical range in the U.S., is not a valid DPS. To address the second and third petition requests, we focused on the brook trout population in the Salmon Trout River and evaluated whether it qualified as a DPS per our policy. We find that the brook trout population in the Salmon Trout River also does not constitute a valid DPS. The remainder of this section details the evaluation of these population segments as DPSs per our 1996 DPS Policy.

*Upper Great Lakes All Brook Trout Population Segment*

This population segment encompasses the range of brook trout populations within the Great Lakes basin that currently or historically occupied both the tributary and lake environments (including stream-resident, adfluvial, and lacustrine ecotypes of brook trout). Although technically not one of the ''Great Lakes,'' we include Lake Nipigon in Canada in this population because it is part of the Great Lakes drainage. The best available information indicates the known historical range of brook trout within the basin included all of Lake Superior and its drainage (including Lake Nipigon), and the northern portions of Lakes Michigan and Huron—specifically, that portion of Lake Michigan north of a line from the Sheboygan River, Wisconsin to Grand Traverse Bay, Michigan, and that portion of Lake Huron north of Thunder Bay, Michigan, eastward to include Manitoulin Island to the 81°30′ longitudinal demarcation and west of 81°30′ longitude (MacCrimmon and Campbell 1969, p. 1701; Dehring and Krueger 1985, p. 1; Enterline 2000, pp. 29–30).

**Discreteness**

*Marked Separation*

As previously described, the Upper Great Lakes brook trout population segment we have evaluated encompasses the range of brook trout populations that currently or historically occupied both the tributary and lake environments within the Great Lakes basin. Brook trout within this population segment are physically isolated from other populations of brook trout as the result of the physical separation between the drainage of the Great Lakes basin and neighboring drainages. Consequently, brook trout in the Great Lakes basin meet the discreteness criterion of being markedly separate from other members of the brook trout taxon.

*International Border*

We presently do not find that the brook trout in the Upper Great lakes on either side of the international United States border with Canada are discrete due to differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms that are significant in light of section 4(a)(1)(D) of the Act.

*Conclusion for Discreteness*

In conclusion, we determine that the Upper Great Lakes brook trout population segment, as defined here, is discrete from the remainder of the brook trout taxon. This discreteness arises from the population segment's physical isolation from the remainder of the taxon. Therefore, we will now consider the potential significance of this discrete population segment to the remainder of the taxon.

Significance

We have determined that the population of brook trout in the Upper Great Lakes meets the discreteness elements of the DPS policy, and as such, we will now evaluate whether this specific population is significant to the taxon as a whole (*i.e.,* native brook trout in eastern North America). A discrete population is considered significant under the DPS policy if it meets one of four of the elements identified in the policy under significance or can otherwise be reasonably justified as being significant.

We discuss further below our evaluation of the significance of the population of brook trout in the Upper Great Lakes relative to the taxon as a whole.

*Evidence of the Persistence of the Discrete Population Segment in an Ecological Setting That Is Unusual or Unique for the Taxon*

On the basis of an evaluation of the best available scientific information, we have determined that the habitat for brook trout in the Upper Great Lakes does not represent an ecological setting that is unusual or unique for the native brook trout relative to the habitat available to it throughout the entire taxon's range in eastern North America. A summary of our evaluation is below.

Brook trout exhibiting differing life-history forms occupy a variety of ecosystems from subarctic regions of the Hudson Bay coast, to temperate areas bordering and east of the Great Lakes, and southern coldwater habitats in the Appalachian Mountains of Tennessee and Georgia (Power 1980, p. 142). They have been successfully naturalized in western North America, South America, Eurasia, Africa, and New Zealand (MacCrimmon and Campbell 1969, p. 1699, pp. 1703–1717). Within their large native range in eastern North America, brook trout habitat includes coastal areas and various-sized lakes, streams, and rivers at varying altitudes. Most populations inhabit coldwater streams, but lake-dwelling and lake-spawning (lacustrine form) populations also occur throughout the range, in spring-fed ponds, small- to medium-sized lakes, and a few large, oligotrophic (containing relatively little plant life or nutrients, but rich in dissolved oxygen) lakes. Anadromous populations (''salters'') of brook trout use marine habitats in Hudson Bay and along the Atlantic coast.

The upper Great Lakes represent a complex ecological setting for brook trout. The very large size of the Great Lakes watershed creates an environment that more closely resembles oceanic physical conditions (available to the anadromous forms of brook trout) than conditions in smaller lakes (available to other forms of brook trout). With approximately 1,500 tributaries and almost 2,800 miles (4,506 km) of shoreline, Lake Superior also provides brook trout access to a very large freshwater habitat network. Although the Great Lakes are the largest freshwater water bodies occupied by brook trout, there are thousands of lakes in its range including large postglacial lakes further north in Canada that contain populations of the adfluvial and lacustrine forms (*e.g.,* Fraser and Bernatchez 2008, p. 1193).

If predicted rising water temperatures in response to climate change are realized over the entire range of brook trout, the distributions of brook trout populations would probably shift toward cooler waters at higher latitudes and altitudes (Meisner 1990b, p. 1068; Magnuson *et al.* 1997, p. 859; Kling *et al.* 2003, pp. 53–54). The greatest effects would likely begin in populations located at the margins of the taxon's hydrologic and geographic distributions (Meisner *et al.* 1990a, p. 282, Kling *et al.* 2003, p. 54). Although the upper Great Lakes have already experienced some impacts of climate change (*see* Kling *et al.* 2003, pp. 14–16) and will not be immune to future impacts (*see* Kling *et al.* 2003, pp. 21–25), they may provide substantial coldwater habitat for brook trout in the future. However, brook trout have abundant coldwater habitat available in the northern latitudes of its range, and habitat in northern North America which is presently too cold may develop into appropriate brook trout habitat under a warming scenario. We will further evaluate the extent that this may be the case in the range-wide assessment of native brook trout that we plan to conduct (*see* **Finding** section).

Although the upper Great Lakes represent a diverse and complex ecological setting which may offer potential coldwater habitat for brook trout, we must evaluate the breadth of ecological diversity of brook trout habitat rangewide in our assessment of this population segment's significance to the rest of the taxon. First, available information indicates that the large area and wide geographical range of brook trout habitats, which vary in latitude and altitude and water form, contain a vast diversity of habitats for brook trout. The ecological setting of the upper Great Lakes is a small portion of the brook trout range, and based on available information, its relative significance to the brook trout species is limited. Second, although we expect that the Great Lakes may offer substantial coldwater habitat, there are other large, deep, oligotrophic lakes, and numerous lakes and streams at higher latitudes that may buffer the species from potential climate change impacts. Given the available information on the diversity and extent of ecological settings of brook trout in the rest of its range, we conclude at this time that the upper Great Lakes is a not unique or unusual setting of significance for the native brook trout in eastern North America.

*Evidence That Loss of the Population Segment Would Result in a Significant Gap in the Range of the Taxon*

Loss of brook trout, including any or all life forms, in the upper Great Lakes, when considered in relation to brook trout throughout the remainder of the species' range in eastern North America, would mean the loss of a small geographic portion (approximately ten percent) of the entire range of the taxon. Further, the number of streams with populations in the upper Great Lakes (about 200) are a small proportion of the amount of streams and lakes with brook trout populations in the rest of the native range in eastern North America. Due to the broad geographic range of brook trout, the wide diversity of habitats available to it, and its plasticity, and the fact that the upper Great Lakes are at the western periphery of its natural range, we find that the gap in the range resulting from the loss of brook trout in the upper Great Lakes would not be significant.

*Evidence That the Population Segment Represents the Only Surviving Natural Occurrence of a Taxon That May Be More Abundant Elsewhere as an Introduced Population Outside Its Historical Range*

This criterion from the DPS policy does not apply to the brook trout in the upper Great Lakes because it is not a population segment representing the only surviving natural occurrence of the taxon that may be more abundant elsewhere as an introduced population outside its historical range. Consequently, this population of brook trout does not meet the significance element of this factor.

*Evidence That the Discrete Population Segment Differs Markedly in Its Genetic Characteristics From Other Populations of the Species*

A large amount of rangewide genetic variation for brook trout is distributed among brook trout populations (large Fst values, values in a fixation index which describe the degree of population differentiation based on genetic polymorphisms). This pattern is heavily influenced by the ecological and life-history characteristics of brook trout populations (population connectivity or isolation, philopatric tendency).

We find that, based on the genetic information currently available (outlined under the Brook Trout Genetics section above), the brook trout in the upper Great Lakes, including all life forms, do not differ markedly from other populations of the species in their genetic characteristics (such as exhibiting unique alleles or a proportion of genetic variability beyond the norm of distribution) such that they should be considered biologically or ecologically significant based simply on genetic characteristics. They do not show any more genetic distinctiveness in comparison to the remainder of the taxon than other populations demonstrate. With the additional consideration that the authority to list DPSs be used ''sparingly,'' we conclude that this population segment of brook trout does not meet the significance element of this factor.

DPS Conclusion—Upper Great Lakes All Brook Trout Population Segment

On the basis of the best available information, we conclude that the all-brook-trout population segment in the Upper Great Lakes is discrete due to marked separation as a consequence of physical, ecological, physiological, or behavioral factors according to the 1996 DPS Policy. However, on the basis of an evaluation of brook trout in the Great Lakes relative to the four significance elements of the 1996 DPS Policy, we conclude that this discrete population segment is not significant to the taxon to which it belongs, and therefore, does not qualify as a DPS under 1996 policy. As such, we find that population of brook trout in the Great Lakes basin is not a listable entity under the Act.

*Upper Great Lakes Coaster-Only Brook Trout Population Segment*

This population segment encompasses the historical range of brook trout populations in the Great Lakes basin exhibiting the coaster ecotypes, which includes northern portions of the Lakes Michigan and Huron and all of Lake Superior, including Lake Nipigon (*see* Discreteness analysis for the Upper Great Lakes All Brook Trout Population Segment below for more detailed range description).

Discreteness

Hubbs and Lagler (1949, p. 44) and Becker (1983, p. 320) described coasters as brook trout that spend a portion of their life cycle in the Great Lakes. Coaster brook trout have long been recognized by local and scientific communities (Newman and Dubois 1997, p. 4).

*Marked Separation*

As described previously, coasters are adfluvial and lacustrine life forms of brook trout that occupy the nearshore zone of the Great Lakes. Coasters, being a subset of brook trout within the Great Lakes basin, are markedly separate from all other brook trout outside of the Great Lakes Basin as the result of the physical separation between the drainage of the Great Lakes basin and neighboring drainages. Thus, brook trout within this population segment are markedly separate from other members of the brook trout taxon outside the Great Lakes basin because they are physically isolated.

Isolation also exists within the Great Lakes basin, among brook trout populations in Lakes Huron, Michigan, Erie, and Ontario. The best available information indicates that adfluvial brook trout likely did not historically occupy lake waters of southern Lakes Michigan and Huron (boundary as previously defined in this section) or Lakes Erie and Ontario (MacCrimmon and Campbell 1969, p. 1700; Bailey and Smith 1981, p. 1549; Dehring and Krueger 1985, p. 1; MIDNR 2008a, pp. 2–3). Brook trout found within these lake areas in the last 100 years are likely the result of stocking as no known adfluvial, migratory or lake dwelling populations exist. The reason that brook trout never occupied these lake areas is unknown; we suspect that unidentified environmental conditions preclude brook trout use of these habitats. Regardless, without brook trout use of the lake environment, natural dispersal between stream populations cannot occur. This absence of adfluvial and lacustrine ecotypes in these populations effectively restricts populations with coaster brook trout forms to the distribution previously defined, namely the watershed and lake habitats of all of Lake Superior, and the northern portions of Lakes Michigan and Huron.

Within the Great Lakes basin, coasters are ecologically, behaviorally, and physiologically discrete from stream-resident brook trout. Coasters are markedly separate from resident brook trout in their lake-dwelling and adfluvial behavior (Hubbs and Lagler 1949, p. 44; Becker 1983, p. 320; Huckins and Baker 2008, p. 1229; Schreiner *et al.* 2008, p. 1350). Lake-dwelling coasters spend their entire life within the lake environment (Huckins *et al.* 2008, p. 1323; Schreiner *et al.* 2008, p. 1350); adfluvial coasters move between streams and the lake (Huckins *et al.* 2008, p. 1323). Stream-resident brook trout remain within the river system. These differences mark an ecological (*i.e.*, lake versus stream habitat) and a behavioral (*i.e.*, migratory) separation between the two forms.

Coaster ecotypes and stream-resident ecotypes of brook trout also differ physiologically in adult size, longevity, age at maturity, and fecundity. As stated in the Species Description section above, adult coasters range in size from 12 to 25 in (30 to 64 cm), and commonly reach lengths of 16 in (41 cm) (Ritchie and Black 1988, pp. 50–51; Quinlan 1999, p. 17; Huckins and Baker 2008, p. 1239; Huckins *et al.* 2008, p. 1337). The body mass of adult coasters typically ranges from 0.75 to 8 pounds (341 to 3632 g) (Quinlan 1999, p. 16; Swainson 2001, p. 60; Huckins and Baker 2008, p. 1239; WIDNR and USFWS 2005, p. 16) with a maximum measurement of 14.5 pounds (6577 g) (Scott and Crossman 1973, p. 211). Adult resident brook trout typically range in size from 5 to 15 in (13 to 38 cm) (Scott and Crossman 1979, p. 208; Becker 1983, pp. 318, 320; WIDNR and USFWS 2005, p. 16; Schram 2008a pers. comm.) and usually weigh less than a pound (<454 g) (WIDNR and USFWS 2005, p. 16). Most female coasters do not reach maturity until they are 2 to 4 years old and 12 to 15 in. (30 to 38 cm) in length (Ritchie and Black 1998, p. 19; Quinlan 1999, p. 11; Huckins and Baker 2008, p. 1241; Huckins *et al.* 2008, p. 1329), and live 5 to 8 years (Quinlan 1999, p. 11; Huckins *et al.* 2008, p. 1328). Whereas most female stream-resident brook trout mature by age 1 or 2 (Becker 1983, p. 318), and typically live to age 3 and rarely reach ages of 4 or 5 years (Scott and Crossman 1973, p. 211, Becker 1983, p. 318). Coaster females produce around 1,500 to 3,000 eggs (Quinlan 1999, p. 20; Swainson 2001, p. 41), while stream-resident brook trout fecundity ranges from 100 to 1,500 eggs per female (Scott and Crossman 1973, p. 210; Power 1980, p. 157; Becker 1983, p. 318).

We recognize that many of the ecological, physiological, and behavioral characteristics discussed here are influenced to varying extents by environmental factors. For example, fish exhibit indeterminate growth, where adults can reach larger sizes in larger habitats with more favorable growth conditions or greater prey availability, but may be more diminutive under less favorable habitat conditions (Huckins *et al.* 2008, p. 1323). To this effect, many physiological characteristics of coasters would be expected to differ from their stream-resident counterparts, with coasters being larger than residents, simply because coasters access the more productive lake environments. In addition, many of the characteristics we evaluate are interrelated, with one characteristic influencing or determining one or more of the other characteristics. For example, fecundity is largely a function of the size and condition of the fish. Also, prey selection will be influenced by the prey availability in different habitat types. We rely on all the characteristics taken together to describe the phenotypic characteristics of each type. Regardless of the source of the phenotypic characteristics of the types, be they controlled by genetic heritability, environmental influences, or both, they accumulate to form a description of each form and that defines either their similarity or separation.

We further recognize that upper Great Lakes brook trout display a continuum of traits in most of the characteristics described. However, the range of overlap is small in comparison to the broader range of difference between the two forms, with the majority of adult coasters and stream-residents clearly occupying nonoverlapping portions of the continuum. Further, at the end of the continuum of traits, coasters are markedly separate in their use of Great Lakes habitat. As we stated in adopting the DPS Policy in 1996, ''logic demands a distinct population recognized under the Act be circumscribed in some way that distinguishes it from other representatives of its species. The standard established for discreteness is simply an attempt to allow an entity given DPS status under the Act to be adequately defined and described'' (61 FR 4721, at 4724; February 7, 1996). In the case of brook trout in the Great Lakes, there is a group that can be clearly distinguished by a variety of characteristics, particularly its use of the Great Lakes habitat, which leads to or results from marked separation in the other characteristics.

Despite the apparent reproductive exchange and genetic similarity between stream-resident forms and coaster forms of brook trout, the life forms remain markedly separated physiologically, ecologically, and behaviorally. The DPS Policy states that ''the standard adopted [for discreteness] does not require absolute separation of a DPS from other members of its species, because this can rarely be demonstrated in nature for any population of organisms * * * [T]he standard adopted allows for some limited interchange among population segments considered to be discrete, so that loss of an interstitial population could well have consequences for gene flow and demographic stability of a species as a whole'' (61 FR 4722; February 7, 1996). Coasters are a group of organisms that can be distinguished from stream-resident brook trout by a variety of characteristics, particularly its migratory life strategy and use of the Great Lakes.

Thus, given marked separation in physical, physiological, ecological, and behavioral factors, we conclude that the coaster-only population segment is discrete from Great Lakes stream-resident brook trout. Further, as stated above, given its marked separation from all other brook trout outside of the Great Lakes Basin as the result of the physical separation between the drainage of the Great Lakes basin and neighboring drainages, the coaster-only population segment is discrete from brook trout outside the Great Lakes basin. Consequently, we find that the coaster-only population satisfies the element of marked separation under the 1996 DPS Policy, and is therefore considered to be a discrete population per our policy.

*International Border*

We presently do not find that this population segment of the brook trout on either side of the international United States border with Canada is discrete due to differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms that are significant in light of section 4(a)(1)(D) of the Act.

Significance

We must next evaluate whether the coaster brook trout population segment is significant to the larger brook trout taxon. We find that, although we determined that coaster brook trout are a discrete population segment, they co-occur with and are a subset of the same population as other brook trout types (stream residents) in the upper Great Lakes (*see* Species Information section above). Review of the best available scientific information does not suggest that the coaster and resident life forms in these populations are genetically distinct from each other, indicating that they are part of one breeding population (D'Amelio and Wilson 2008, p. 1221; Scribner *et al.* 2008, p. 10). Thus, similar to our Upper Great Lakes All Brook Trout population segment, the loss of coasters would not create a significant gap in the range of the taxon, they are not the only remaining natural occurrence of the taxon, and they do not show significant genetic distinctiveness in comparison to the remainder of the taxon. In addition, coasters occupy a smaller portion of the same ecological setting as other brook trout in the upper Great Lakes. Although, as discussed above, coasters may be important to the long-term viability of brook trout populations throughout Lake Superior, the relevant question is whether coasters are significant to the taxon as a whole, here, all native brook trout. Given this, the significance analysis documented for the all brook trout population segment (*see* Upper Great Lakes All Brook Trout DPS section above) also applies to the coaster-only population segment, and we similarly conclude that the coaster-only population segment does not meet the significance elements of the DPS Policy.

DPS Conclusion—Coaster-Only Population Segment

On the basis of the best available information, we conclude that the coaster-only population segment in the Upper Great Lakes is discrete due to marked separation as a consequence of physical, ecological, physiological, or behavioral factors according to the 1996 DPS policy. However, on the basis of the four significance elements in the 1996 DPS Policy, we conclude that this discrete population segment is not significant to the rest of the taxon, and therefore, does not qualify as a valid DPS under our 1996 DPS Policy. As such, we find that the coaster-only population in the upper Great Lakes is not a listable entity under the Act.

Salmon Trout River/South Shore Lake Superior Brook Trout Population Segment

This section evaluates whether the Salmon Trout River-South Shore Lake Superior brook trout population segment qualifies as a DPS. Since the Salmon Trout River contains the only known brook trout population with naturally reproducing coaster on the South Shore of Lake Superior, we addressed these two petition requests in one analysis.

**Discreteness**

*Markedly Separate*

The brook trout population segment that occupies the Salmon Trout River is markedly separate from other members of the brook trout taxon because it is genetically or reproductively isolated. This physical isolation is supported by recent evidence from Scribner *et al.* (2008, pp. 12–13), which found no genetic evidence of Salmon Trout River fish in neighboring streams, indicating that Salmon Trout River coasters are not a source of gene flow among streams.

*International Border*

Since the Salmon Trout River population segment does not cross an international border, this basis for finding discreteness is not applicable.

In conclusion, the Salmon Trout River brook trout population segment, as defined here, meets the element for discreteness under our 1996 DPS Policy and is considered discrete from the remainder of the brook trout taxon. This discreteness arises from the population segment's genetic or reproductive isolation from the remainder of the taxon which is supported by evidence of genetic discontinuity.

**Significance**

*Evidence of the Persistence of the Discrete Population Segment in an Ecological Setting That Is Unique for the Taxon*

The ecological setting for the Salmon Trout River discrete population segment is similar to that of other brook trout populations throughout the upper Great Lakes region. We are unaware of any features that make the Salmon Trout River unique or unusual in terms of brook trout habitat. There is nothing about the ecological setting that is unique or unusual for the species, particularly in light of the other occurrences within Lake Superior. Consequently, this population of brook trout does not meet the significance element of this factor.

*Evidence That Loss of the Population Segment Would Result in a Significant Gap in the Range of the Taxon*

This criterion from the DPS policy does not apply to the Salmon Trout River discrete population segment because this population is one of thousands of brook trout populations existing throughout the range of the taxon and its loss would represent an extremely small portion of the range. Consequently, this population of brook trout does not meet the significance element of this factor.

*Evidence That the Population Segment Represents the Only Surviving Natural Occurrence of a Taxon That May Be More Abundant Elsewhere as an Introduced Population Outside Its Historical Range*

This criterion from the DPS policy does not apply to the Salmon Trout River discrete population segment because it is not a population segment representing the only surviving natural occurrence of the taxon that may be more abundant elsewhere as an introduced population outside its historical range. Consequently, this population of brook trout does not meet the significance element of this factor.

*Evidence That the Discrete Population Segment Differs Markedly in Its Genetic Characteristics From Other Populations of the Species*

Scribner *et al.* (2008, p. 9) indicates that Lake Superior brook trout populations, including the Salmon Trout River, are highly genetically structured with low levels of gene flow among populations. The Salmon Trout River contains two genetically distinct populations that are separated by impassable waterfalls (Scribner *et al.* 2008, p. 10). Both populations in the Salmon Trout River were equally genetically diverged from the other populations included in the study (Scribner *et al.* 2008, p. 7). This pattern of population genetic structuring is common in brook trout throughout the species' range because, like many salmonids, this species likely exhibits some degree of spawning site fidelity (Angers *et al.* 1999, p. 1044; D'Amelio *et al.* 2008, pp. 1347–1348; Mucha and Mackereth 2008, p. 1211). This degree of genetic divergence that forms among populations is reflective of the reproductive connections (isolation) among the populations across the range of the taxon.

We are unaware of any information indicating that this population segment differs from the species in its genetic characteristics (such as exhibiting unique alleles or a proportion of genetic variability beyond the norm of distribution) such that it should be considered biologically or ecologically significant to the taxon based on genetic characteristics. Consequently, this population of brook trout does not meet the significance element of this factor.

DPS Conclusion—Salmon Trout River/South Shore Lake Superior Population Segment

On the basis of the best available information, we conclude that the Salmon Trout River brook trout population segment is ''markedly separated'' from all other populations of the same taxon as a consequence of physical factors, supported by genetic evidence. Consequently, the Service concludes that the petitioned entity is discrete according to the 1996 DPS Policy. However, on the basis of an evaluation of the four significance elements of the 1996 DPS Policy, we conclude that this discrete population segment is not significant to the species to which it belongs. Therefore, we find that the Salmon Trout River brook trout population does not qualify as a DPS under our DPS Policy and is consequently not a listable entity under the Act.

**Significant Portion of the Range Analysis**

The Act defines an endangered species as one ''in danger of extinction throughout all or a significant portion of its range,'' and a threatened species as one ''likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' Having determined that the northern Great Lakes population segment of brook trout and the Salmon Trout River/South Shore Lake Superior populations of the coaster brook trout do not meet the elements of our 1996 DPS Policy as being valid DPSs, we then assessed whether the upper Great Lakes brook trout is a significant portion of the range (SPR) of the native brook trout where the species is in danger of extinction or likely to become so in the foreseeable future.

On March 16, 2007, a formal opinion was issued by the Solicitor of the Department of the Interior, ''The Meaning of 'In Danger of Extinction Throughout All or a Significant Portion of Its Range' '' (DOI 2007). We have summarized our interpretation of that opinion and the underlying statutory language below. A portion of a species' range is significant if it is part of the current range of the species and is important to the conservation of the species because it contributes meaningfully to the representation, resiliency, or redundancy of the species. The contribution must be at a level such that its loss would result in a decrease in the ability of the species to persist.

The first step in determining whether a species is endangered in an SPR is to identify any portions of the range of the species that warrant further consideration. The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose to analyzing portions of the range that are not reasonably likely to be significant and threatened or endangered. To identify those portions that warrant further consideration, we determine whether there is substantial information indicating that (i) the portions may be significant and (ii) the species may be in danger of extinction there. In practice, a key part of this analysis is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats applies only to portions of the range that are unimportant to the conservation of the species, such portions will not warrant further consideration.

The petition specified two portions of the range of brook trout: (1) The historical range of coaster brook trout in the contiguous U.S., namely the upper Great Lakes, and (2) the Salmon Trout River/South Shore Lake Superior. In our SPR analysis, we assessed threats to brook trout in these portions in comparison to threats acting on other portions of the range. Information on threats within the upper Great Lakes region included primarily habitat degradation, overutilization, nonnative fishes, and loss of connectivity and life-history diversity. We had comparatively less detailed information on the threats acting throughout the rest of the range. The best information available to us regarding other portions of the brook trout range was found in analyses completed for the Eastern Brook Trout Joint Venture (*see* Hudy *et al.* 2005, TU 2006). Given the information available to us on threats to brook trout across its range, we conclude that threats to this species were similar throughout its range, that the conservation status of the species is similar throughout its range, and that there is no area within the range of the upper Great Lakes and the Salmon Trout River/South Shore Lake Superior portions of the coaster brook trout where potential threats to this species are significantly concentrated or are substantially greater than in other portions of the range. We found no evidence that more threats were geographically concentrated within the upper Great Lakes than in any other part of the range; according to the findings of Hudy *et al.* (2005), it seems that threats may be greater in portions of the Northeastern U.S. populations than in the Great Lakes.

Therefore, we find that the brook trout is not threatened or endangered solely in any significant portion of its range within the upper Great Lakes. As stated in the **Finding** section below, we plan to initiate a range-wide assessment of the native brook trout that will enable us to better understand the status of the native brook trout across the range of species, including a determination of whether the threats to the species, which are not concentrated in the upper Great Lakes, warrant listing the native brook trout rangewide.

## Finding

In making this finding, we considered information provided by the petitioners, as well as other information available to us concerning coaster brook trout. We have carefully assessed the best scientific and commercial information available regarding the status of and threats to coaster brook trout in the upper Great Lakes. We reviewed the petition, and available published and unpublished scientific and commercial information. We also consulted with Federal and State land managers, along with recognized experts in conservation and population genetics and brook trout and salmonid biology. This 12-month finding reflects and incorporates information that we received from the public following our 90-day finding or that we obtained through consultation, literature research, and field visits.

On the basis of this review, we have determined that the coaster brook trout in the upper Great Lakes does not meet the elements of our 1996 DPS Policy as being a valid DPS. We also find that the coaster brook trout is not an SPR of the native brook trout and does not warrant further consideration as such under the Act. Therefore, we find that the coaster brook trout is not a listable entity under the Act, and that listing is not warranted.

Although we find that population segments analyzed above are not listable entities, we found enough information concerning the diversity, habitats, population structure, threats, and trends of the native brook trout in its entire range to initiate a range-wide assessment that will enable us to better understand the status of the native brook trout across the range of species. Completing a range-wide assessment will allow us to better evaluate if any population would meet the elements of the DPS policy or constitute an SPR of the taxon. We will also continue to assess the status of and threats to both the upper Great Lakes and Salmon Trout River/South Shore Lake Superior populations of the coaster brook trout.

We request that you submit any new information concerning the taxonomy, biology, ecology, and status of the brook trout in its entire native range. Send this information to the Region 3 Fish and Wildlife Service Regional Office (*see* **ADDRESSES** section) whenever it becomes available. We will accept additional information and comments from all concerned governmental agencies, the scientific community, industry, or any other interested party concerning this finding; and will reconsider this determination with new information as appropriate. The Service continues to strongly support the cooperative conservation and restoration of the coaster brook trout in the upper Great Lakes.

## References

A comprehensive list of the referenced materials is available upon request (*see* **ADDRESSES** section above).

## Author

The primary authors of this document are staff located at the Region 3 Fish and Wildlife Service Regional Office (*see* **ADDRESSES**).

## Authority

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

**Stephen Guertin,**

*Acting Deputy Director, U.S. Fish and Wildlife Service.*

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