D. The Unfunded Mandates Act

The Unfunded Mandates Reform Act of 1995 also requires (in section 202) that agencies perform an assessment of anticipated costs and benefits before proposing any rule that may result in a mandated expenditure in any one year by State, local, or Tribal governments, in the aggregate, or by the private sector, of $100 million. Because this proposed rule does not mandate any new spending requirements or costs, but rather provides for a 1 year transition policy, we do not believe it has any unfunded mandate implications.

E. Federalism

Executive Order 13132 establishes certain requirements that an agency must meet when it promulgates a proposed rule (and subsequent final rule) that imposes substantial direct compliance costs on State and local governments, preempts State law, or otherwise has Federalism implications. We do not believe this proposed rule in any way imposes substantial direct compliance costs on State and local governments or preempts or supersedes State or local law.

F. Executive Order 12866

In accordance with the provisions of Executive Order 12866, this regulation was reviewed by the Office of Management and Budget.

List of Subjects Affected in 42 CFR Part 447

Accounting, Administrative practice and procedure, Drugs, Grant programs-health, Health facilities, Health professions, Medicaid, Reporting and recordkeeping requirements, Rural areas.

For the reasons set forth in the preamble, the Health Care Financing Administration proposes to amend 42 CFR part 447 as follows:

PART 447—PAYMENTS FOR SERVICES

1. The authority citation for part 447 continues to read as follows:

Authority: Sec. 1102 of the Social Security Act (42 U.S.C. 1302).

2. In § 447.272, revise paragraph (e)(2)(ii)(A) and add a new paragraph (e)(2)(ii)(D) to read as follows:

§ 447.272 Inpatient services: application of upper payment limits.

* * * * *

(e) * * *

(2) * * *

(ii) * * *

(A) For State plan provisions that are effective on or after October 1, 1999 and were approved before January 22, 2001, payments may exceed the upper payment limit in paragraph (b) of this section until September 30, 2002.

* * * * *

(D) For State plan provisions that were effective on or after October 1, 1999 and were submitted to HCFA before March 13, 2001 (and were approved on or after January 22, 2001), payments may exceed the limit in paragraph (b) of this section until the later of March 13, 2001, or 1 year from the approved effective date of each State plan provision.

* * * * *

3. In § 447.321, revise paragraph (e)(2)(ii)(A) and add a new paragraph (e)(2)(ii)(D) to read as follows:

§ 447.321 Outpatient hospital and clinic services: Application of upper payment limits.

* * * * *

(e) * * *

(2) * * *

(ii) * * *

(A) For State plan provisions that are effective on or after October 1, 1999 and were approved before January 22, 2001, payments may exceed the upper payment limit in paragraph (b) of this section until September 30, 2002.

* * * * *

(D) For State plan provisions that were effective on or after October 1, 1999 and were submitted to HCFA before March 13, 2001 (and were approved on or after January 22, 2001), payments may exceed the limit in paragraph (b) of this section until the later of March 13, 2001, or 1 year from the approved effective date of each State plan provision.

* * * * *

(Catalog of Federal Domestic Assistance Program No. 93.778, Medical Assistance Program)

Dated: March 27, 2001.

Michael McMullan,

Acting Deputy Administrator, Health Care Financing Administration.

[FR Doc. 01–8178 Filed 3–29–01; 3:47 pm]

BILLING CODE 4120–01–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Parts 223 and 224

[Docket No. 010312061–1061–01; I.D. 061199B]

RIN 0648–XA63

Endangered and Threatened Species: Puget Sound Populations of Copper Rockfish, Quillback Rockfish, Brown Rockfish, and Pacific Herring

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

ACTION: Notice of determination of status review.

SUMMARY: NMFS has completed an Endangered Species Act (ESA) status review for copper rockfish (*Sebastes caurinus*), quillback rockfish (*S. maliger*), brown rockfish (*S. auriculatus*), and Pacific herring (*Clupea pallasi*) populations in the eastern North Pacific Ocean. After reviewing the available scientific and commercial information, NMFS has determined that the petitioned populations of the three rockfish species in Puget Sound, WA do not warrant listing as threatened or endangered at this time. NMFS also concludes that the petitioned Pacific herring populations are part of a larger distinct population segment (DPS) that qualifies as a species under the ESA but does not warrant listing as threatened or endangered at this time.

ADDRESSES: Protected Resource Division, NMFS, 525 NE Oregon Street, Suite 500, Portland, OR 97232. Reference materials regarding this determination can be obtained via the Internet at *www.nwr.noaa.gov/1salmon/salmesa/pubs.htm* .

FOR FURTHER INFORMATION CONTACT: Garth Griffin, NMFS, Northwest Region (503) 231–2005, or Marta Nammack, NMFS, Office of Protected Resources (301) 713–1401.

SUPPLEMENTARY INFORMATION:

Petition Background

On February 8, 1999, the Secretary of Commerce received a petition from Sam Wright of Olympia, WA, to list as threatened or endangered under the ESA and to designate critical habitat for 18 species of marine fishes in Puget Sound, WA. On June 21, 1999 (64 FR 33037), NMFS accepted the petition for seven of these species, including Pacific herring and three members of the genus

Sebastes: copper rockfish, quillback rockfish, and brown rockfish. Although there was not enough information to warrant reviews for 11 of the petitioned rockfish species, NMFS believes that the assessments for copper, quillback, and brown rockfish reflect current trends and risks for Puget Sound rockfish in general. Findings for three of the seven species (Pacific hake, Pacific cod, and walleye pollock) have already been completed and were announced on November 22, 2000 (65 FR 58612).

The petitioner requested listings for ''species/populations or evolutionary [sic] significant units'' in Puget Sound, WA. Under the ESA, a listing determination can address a species, subspecies, or DPS of a vertebrate species (16 U.S.C. 1532 (15)). The term ''evolutionarily significant unit'' is currently defined only for Pacific salmonid DPSs (56 FR 58612, November 20, 1991). Therefore, to define the four species being discussed here, NMFS relied on the DPS framework described in the joint NMFS/USFWS policy (61 FR 4722, February 7, 1996). See ''Consideration as a 'Species' Under the ESA'' section of this document.

To ensure a comprehensive review, NMFS requested comments from any party having relevant information concerning: (1) biological or other relevant data that may help identify rockfish and Pacific herring DPSs; (2) the range, distribution, and size of these species' populations in Puget Sound and coastal waters of Washington and British Columbia; (3) current or planned activities and their possible effects on these species; and (4) efforts being made to protect these species in Washington and British Columbia. NMFS also asked for quantitative evaluations of the quality and extent of the species' estuarine and marine habitats and information on areas that may qualify as critical habitat in Washington. Although the status review focused on the petitioned populations in Puget Sound, NMFS also considered populations from the U.S. West Coast, British Columbia, and Alaska, because of their geographic proximity and potential relationship to populations in Puget Sound.

A NMFS Biological Review Team (BRT) made up of staff from NMFS' Northwest Fisheries Science Center, Southwest Fisheries Science Center, Alaska Fisheries Science Center, and the U.S. Fish and Wildlife Service (USFWS) has reviewed the best available scientific and commercial information pertaining to copper rockfish, quillback rockfish, brown rockfish, and Pacific herring from California to Alaska (NMFS, 2001a and 2001b). This document summarizes the principal results of this status review. Copies of the entire BRT report and other documents relevant to this review are available upon request (see **ADDRESSES**).

Biological Background

This section describes the general physical setting and biological attributes of copper rockfish, quillback rockfish, brown rockfish, and Pacific herring. More detailed information can be obtained from the NMFS status reviews (NMFS, 2001a and 2001b) and species accounts contained in Miller and Lea (1972), Hart (1973), Eschmeyer *et al.* (1983), and Kessler (1985).

The petition focused on populations in Puget Sound, a fjord-like estuary located in northwest Washington State that covers an area of about 9,000 km^2 and has about 3,700 km of coastline. It is subdivided into five basins or regions: (1) North Puget Sound, (2) Main Basin, (3) Whidbey Basin, (4) South Puget Sound, and (5) Hood Canal. The Georgia Basin is an international water body that encompasses the marine waters of Puget Sound, the Strait of Georgia, and the Strait of Juan de Fuca. The coastal drainage of the Georgia Basin is bounded to the west and south by the Olympic and Vancouver Island Mountains, and to the north and east by the Cascade and Coast Ranges.

The petition addressed only those populations of rockfish and Pacific herring found in Puget Sound. The petitioner stated that there may be genetic differences between rockfish in the northern and southern regions of Puget Sound as a result of physical and reproductive isolation. In addition, the petition cited information on genetic population subdivision for some species. The petitioner also noted life-history differences between some rockfish populations and pointed out discrete spawning areas for some species in Puget Sound. The petitioner used similar criteria to support individual population structures for Pacific herring in Puget Sound. The petitioner stated that differences in spawning time, spawning areas, and growth rates indicate that 18 herring population groups exist in Puget Sound. The petition placed considerable weight on four populations reported as ''depressed'' or at a critically low level of abundance (West, 1997; Bargmann, 1998). One of these populations is located in Cherry Point, one in Discovery Bay, one in Port Susan, and one in Port Orchard and Port Madison. The 14 remaining Puget Sound populations are classified as ''unknown,'' ''moderately healthy,'' or ''healthy'' (Bargmann, 1998).

Copper Rockfish

Copper rockfish are found from the Gulf of Alaska southward to central Baja California (Eschmeyer *et al.*, 1983; Stein and Hassler, 1989; Matthews, 1990a; Love, 1996) and are common in Puget Sound (Buckley and Hueckel, 1985; Quinnel and Schmitt, 1991). Adult copper rockfish are found in nearshore waters from the surface to 183 m deep (Eschmeyer *et al.*, 1983; Stein and Hassler, 1989).

Larval and small juvenile copper rockfish are pelagic for several months and are frequently found in surface waters and shallow habitats (Stein and Hassler, 1989; Love et al., 1991). They use bays as nursery areas (Stein and Hassler, 1989) and recruit to nearshore substrates in surface waters. Juveniles migrate from surface to benthic habitats (Matthews, 1990b). In the Georgia Basin, small young-of-the-year copper rockfish are associated with cobble substrate and rock piles. They are also found under pieces of bark or kelp fronds lying on the bottom (Patten, 1973; Love, 1996; Love *et al.*, 1991). Benthic aquatic plants and crevices are also important habitats (Buckley, 1997).

Adult copper rockfish are associated with sand/gravel bottoms and rocky areas in shallow water (Eschmeyer *et al.*, 1983; Haldorson and Richards, 1986; Stein and Hassler, 1989). They inhabit natural rocky reefs, artificial reefs, and rock piles that are closely associated with submerged vegetation (Matthews, 1990c). Once adults find a suitable reef, they have a strong tendency to remain there (Stein and Hassler, 1989; Matthews, 1990c; Love, 1996).

In Puget Sound, copper rockfish males and females become sexually mature at 3 to 4 years of age (Stein and Hassler, 1989). They spawn once a year and, like all *Sebastes* species, are ovoviviparous, i.e., eggs are fertilized internally and develop within the mother and hatch there or immediately after they are released. Mating/fertilization typically occurs from March to May (DeLacy *et al.*, 1964). Egg production ranges from 15,000 eggs in a 24–cm female to 640,000 in a 47–cm female (DeLacy *et al.*, 1964). Embryos are mature by April, and larvae are released from April to June (DeLacy *et al.*, 1964; Matthews, 1990b). Adults move inshore to release their young (Matthews, 1990a).

Larvae are 5 to 6 mm at birth and remain pelagic until they are 40 to 50 mm long (Stein and Hassler, 1989). Juvenile growth rates range from 0.15 to 0.20 mm/day (Love *et al.*, 1991). Growth rates are highest during the summer coinciding with high feeding rates and

off-shore nutrient upwelling (Stein and Hassler, 1989). Copper rockfish live up to 55 years (Matthews, 1990b) and can grow to 57 cm (Eschmeyer *et al.*, 1983; Stein and Hassler, 1989).

Quillback Rockfish

Quillback rockfish are found from the northern Channel Islands in southern California (R. Lea, California Department of Fish and Game, pers. comm. cited in NMFS, 2001a), to the Gulf of Alaska (Miller and Lea, 1972). They are common in the Strait of Georgia, San Juan Islands, and Puget Sound (Clemons and Wilby, 1961; Hart, 1973; Matthews, 1990a; Love, 1996).

Quillback rockfish are found in subtidal waters to depths of 275 m (Hart, 1973; Love, 1996), but typically inhabit depths from 41 m to 60 m (Murie *et al.*, 1993; Love, 1996). Larval and juvenile stages occupy mid-water habitats before they settle–usually in sandy/muddy habitats at moderate depths (Buckley, 1997). These juveniles (18-25 mm) gradually settle in shallow waters along the shores and are associated with submerged vegetation, bull kelp beds, natural rock configurations, and natural and artificial reefs (West *et al.*, 1994). Young-of-the-year quillback rockfish are found on sandy bottoms associated with eelgrass and natural and artificial reefs (Matthews, 1990b).

Adults are solitary reef-dwellers living near or on the bottom (Miller and Lea, 1972; Matthews, 1988; Rosenthal *et al.*, 1988; Love, 1996). They live among rocks, artificial and natural reefs, or on coarse sand or pebble substrates near reefs, particularly in areas with a high abundance of flat-bladed kelp (Love, 1996). Adult quillback rockfish have been known to return to their homesites after being displaced up to 6.4 km, indicating site fidelity (Patten, 1973).

In Puget Sound, most female quillback rockfish become sexually mature at 4 to 5 years of age, although a few become sexually mature at two or three (Gowan, 1983). Mating takes place in March and the larvae are released in May (Matthews, 1990b). They spawn from April to July, though the peak spawning period is early in the season (Love, 1996; Matthews, 1988).

Quillback rockfish can grow to 61 cm (Clemons and Wilby, 1961; Hart, 1973; Love, 1996) and can live to be more than 50 years old (Gowan, 1983; Love, 1996). Growth rates vary within the species' range; off southeastern Alaska a 12-year-old is approximately 31 cm in length whereas a 12-year-old would be 18 cm off the coast of California (Love, 1996).

Brown Rockfish

Brown rockfish range from central Baja California, to southeastern Alaska (Miller and Lea, 1972; Hart, 1973; Eschmeyer et al., 1983; Stein and Hassler, 1989; Matthews, 1990b; Love, 1996). Brown rockfish are common in shallow water (Matthews, 1990a; Matthews, 1990b) and are found from the surface to a depth of 128 m (Eschmeyer *et al.*, 1983). However, they are most common in waters below a depth of 6 m and are widely distributed in shallow-water bays (Love, 1996). Brown rockfish use estuaries as nursery grounds (Stein and Hassler, 1989) and are common in Puget Sound (Hart, 1973).

Brown rockfish settle when they are 18 to 25 mm in length–choosing shallow, vegetated habitats such as kelp beds or eelgrass (West *et al.*, 1994). Juveniles gradually move into deeper water as they mature (Love, 1996). Brown rockfish are bottom dwellers–living on hard bottoms such as siltstone or sand (Lea, 1992). Adults aggregate near rocks, oil platforms, sewer pipes, and even old tires (Matthews, 1990b; Love, 1996). They display strong reef fidelity on natural and artificial reefs in Puget Sound. They rarely move more than 3 kilometers (Matthews, 1990a) and they have a strong homing tendency (Love, 1996).

In Puget Sound, male and female brown rockfish mature at 4 to 7 years of age (Matthews, 1987). They mate in March and April (Stein and Hassler, 1989) and give birth in June (Hart, 1973). They spawn once per year (Stein and Hassler, 1989), unlike females off the California coast that spawn more often (Love, 1996). A 31–cm female brown rockfish produces approximately 52,000 young and a 48–cm female produces approximately 339,000 young (Hart, 1973).

Brown rockfish are 5 to 6 mm in length at birth (Stein and Hassler, 1989) and grow to a length of 55 cm (Hart, 1973; Love, 1996). Males and females grow at the same rate and mature at similar ages and lengths (Love, 1996).

Pacific Herring

Pacific herring in the Eastern Pacific Ocean range from northern Baja California north to Cape Bathurst in the Beaufort Sea (Hart, 1973; Lassuy, 1989). They are also found in Arctic waters from Coronation Gulf, Canada, to the Chuckchi Sea and the Russian Arctic. In the Western Pacific they are found from Toyama Bay, Japan, west to Korea and the Yellow Sea (Haegele and Schweigert, 1985; Wang, 1986).

Pacific herring larvae drift in the ocean currents after hatching and are abundant in shallow nearshore waters (Eldridge and Kaill, 1973; Suer, 1987). Juveniles usually stay in nearshore shallow-water areas until fall. After their first summer, they disperse to deeper offshore waters or reside year-round in some estuaries (Wang, 1986). For instance, some populations of Puget Sound Pacific herring spend their entire lives in Puget Sound while other populations summer in the coastal areas of Washington and southern British Columbia (Trumble, 1983). Adult Pacific herring school at depths between 100 and 150 m (Eldridge and Kaill, 1973; Suer, 1987) and move toward the surface to feed at dawn and dusk. They exhibit inshore–offshore movements associated with spawning and feeding (Morrow, 1980).

Adults move inshore during winter and early spring and reside in holding areas before moving to adjacent spawning grounds (Emmett et al., 1991). Spawning grounds are typically in sheltered inlets, sounds, bays, and estuaries (Haegele and Schweigert, 1985). In the state of Washington there are 19 well-defined spawning locations; 18 in Puget Sound and one on the coast (Bargman, 1998; Lemberg *et al.*, 1997). The spawning locations and timing are very consistent and predictable from year to year (Hay and Outram, 1981; O'Toole *et al.*, 2000).

Herring spawning time varies with latitude. In the south, spawning begins in November; farther north it begins in August (Lassuy 1989; Emmett et al., 1991). Spawning peaks in February and March in Puget Sound (Trumble, 1983); however, the Cherry Point population spawns from early April to early June, with peak spawning in May (O'Toole *et al.*, 2000). Pacific herring usually spawn at night in shallow subtidal zones (Emmett *et al.*, 1991; Bargman, 1998). In Puget Sound, a significant amount of spawning takes place during the day (Washington Department of Fish and Wildlife (WDFW), 2000). They deposit their eggs over vegetation or other substrates in intertidal and subtidal areas–where they adhere. Normally, this takes place at depths no greater than 2 m below low tide (Emmett *et al.*, 1991).

Pacific herring fecundity increases with the size of the female. A 19–cm female produces 19,000 eggs annually and a 22–cm female produces 29,500 (Hart, 1973). In general, there appears to be a decline in fecundity for a given length when moving from south (Puget Sound) to north (Prince William Sound) and northwest (Peter the Great Bay) (Garrison and Miller, 1982).

Pacific herring larvae range from 5 to 26 mm in length (Emmett *et al.*, 1991). It takes 2 to 3 months for the larvae to

metamorphose into 35 to 150 mm juveniles–depending upon the region (Emmett *et al.*, 1991). Herring juveniles gather in large schools and remain primarily in inshore waters during their first summer. After the first summer they may move offshore until maturation (Stocker and Kronlund, 1985) or remain inshore until their first spawning event (Hay, 1985). Age at first maturity is generally 2 to 5 years (Hay, 1985) and lengths range from 13 to 26 cm (Garrison and Miller, 1982; Emmett *et al.*, 1991). In Puget Sound, Pacific herring may reach sexual maturity at age 2 and lengths of 14 to 16 cm (Katz, 1942). Populations in the Strait of Georgia reach sexual maturity at age 4 (Trumble, 1979).

Consideration as a ''Species'' Under the ESA

To qualify for listing as a threatened or endangered species, the petitioned populations of Puget Sound, copper rockfish, quillback rockfish, brown rockfish, and Pacific herring must be considered ''species'' under the ESA. Section 3(15) of the ESA defines a ''species'' to include any ''distinct population segment of any species of vertebrate which interbreeds when mature.'' On February 7, 1996, the USFWS and NMFS adopted a policy to clarify their interpretation of the phrase ''distinct population segment of any species of vertebrate fish or wildlife'' for the purposes of listing, delisting, and reclassifying species under the ESA (51 FR 4722). The joint policy identifies two elements that must be considered when making DPS determinations: (1) The discreteness of the population segment in relation to the remainder of the species (or subspecies) to which it belongs; and (2) the significance of the population segment to the species or subspecies to which it belongs.

Discreteness. According to the joint policy mentioned here, a population segment may be considered discrete if it satisfies either one of the following conditions: (1) It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors; or (2) it is delimited by international governmental boundaries across which there is a significant difference in exploitation control, habitat management, or conservation status.

Significance. The joint policy states that the following are some of the considerations that may be used when determining the significance of a population segment to the taxon to which it belongs: Persistence of the discrete population in an unusual or unique ecological setting for the taxon; evidence that the loss of the discrete population segment would cause a significant gap in the taxon's range; evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere; or evidence that the discrete population segment has marked genetic differences from other populations of the species.

This status review applies the DPS criteria to marine fish species over a broad area of the North Pacific Ocean and, as noted previously, NMFS' assessment includes populations from a larger range (i.e., U.S. West Coast, British Columbia and southeast Alaska) than the populations petitioned. NMFS considered several kinds of information in the attempt to delineate DPSs of copper rockfish, quillback rockfish, brown rockfish, and Pacific herring. The first kind of information centered on habitat characteristics that might indicate a population segment occupies an unusual or unique ecological setting for the species as a whole. The second kind of information dealt with geographical variability in phenotypic and life-history traits that might reflect local adaptation. Such traits may have an underlying genetic basis, but are often strongly influenced by local environmental factors. The third kind of information consisted of mark-recapture studies, which give insight into individuals' physical movement patterns. The fourth kind of information consisted of traits that are inherited in a predictable way and remain unchanged throughout the life of an individual. Differences among populations in the frequencies of these genetically determined traits may reflect the degree to which the populations are isolated from one another. Based on the DPS criteria described above, and after assessing the best available scientific and commercial information, NMFS has identified DPSs for each petitioned species. These DPSs and the information used to characterize them are discussed below.

General Life History Traits of Rockfish

Copper, quillback, and brown rockfish have a common genetic lineage, the *Pteropodus*subgenus within the genus *Sebastes*(Seeb, 1986; Taylor, 1998; Rocha-Olivares *et al.*, 1999). They are all sedentary, non-schooling fish. The *Pteropodus* rockfish are the shallowest–dwelling group and are most likely to release larvae that are subject to local retention mechanisms such as currents and eddies. The females can regulate where and when they release larvae, typically after the spring upwelling season. At birth, larvae are capable of swimming and buoyancy control. They are larger and more developed than other *Sebastes* larvae (G. Moser, NMFS, pers. comm., cited in NMFS, 2001a), and move to adult habitats at a smaller size (Anderson, 1983; Carr, 1991). These factors alter the period of passive dispersal and shorten the overall planktonic dispersal phase which, in turn, increases larval retention.

The rockfish mating process is a possible mechanism for reproductive isolation as it involves an elaborate behavioral ritual of assortative (non–random) mating (Shinomiya and Ezaki, 1991). Thus, if larvae successfully disperse and recruit to a distant population, localized behavior can prevent successful mating. Analyses of microsatellite nuclear DNA clearly show populations living in the same location assortatively mating despite sharing many other common genetic traits (Narum, 2000). In addition, seasonal reproduction timing may isolate adults from different basins even if they successfully disperse into an adjacent basin. If colonists from areas of the outer coast migrate to different portions of the Georgia Basin it is likely that their differences in color pattern, mating behavior, or reproduction timing would lead to reproductive isolation.

The *Pteropodus* rockfishes have a strong homing tendency and reef fidelity. Also, on high–relief reefs in Puget Sound, they maintain small home ranges (within 30 m^2) (Matthews 1990a). On low–relief reefs, they have considerably larger home ranges (400 to 1500 m^2). They inhabit low-relief reefs during the summer–coinciding with peak algal cover and return to high-relief reefs for the winter (Matthews, 1990a). All of these life history characteristics indicate that their dispersal is limited.

Copper Rockfish

NMFS examined a number of studies to determine whether the petitioned Puget Sound populations are reproductively isolated enough to be distinct from coastal populations (or each other). NMFS assessed information showing statistically significant morphometric and meristic differences between Puget Sound copper rockfish and those from Monterey and Southern California (Chen, 1986). In contrast, there was not enough evidence to show that Puget Sound populations were isolated from other populations in the Georgia Basin or on the outer coast.

NMFS also analyzed the considerable genetic evidence to further evaluate population discreteness. For instance, Seeb (1998) examined allozyme patterns

and microsatellite DNA differences in Puget Sound copper rockfish and those from the coastal waters of Southern California to Alaska. The results showed a significant, genetically based population structure over the entire sample range and demonstrated a marked degree of genetic divergence between populations in Puget Sound ''proper'' and Northern Puget Sound. Puget Sound proper is the body of water east of Deception Pass and to the south and east of Admiralty Head–encompassing Southern Puget Sound, Whidbey Basin, Hood Canal, and the Main Basin.

Another study (P. Wimberger, University of Puget Sound (UPS), pers. comm. cited in NMFS, 2001a) examined genetic variations in seven populations of copper rockfish from Southern California to British Columbia (with particular attention given to the populations in Puget Sound and the greater Georgia Basin). The study indicates that Puget Sound populations show significant genetic divergence from populations outside of the Sound. In fact, all populations sampled were genetically different from the two oceanic populations with the exceptions of samples from the San Juan Islands and northern Vancouver Island. The San Juan Island population appears equally differentiated from populations from the Canadian Gulf Islands in the Strait of Georgia, northern Vancouver Island, and Puget Sound proper. A more recent study examined the population structure in copper rockfish along the outer coast and within the Puget Sound (unpublished manuscript, R. Vetter, NMFS, pers. comm. cited in NMFS, 2001a). It shows that Puget Sound populations have a much greater genetic distance from the nearest population outside the Sound than geographic distance alone would indicate. The results also show Puget Sound proper populations to be genetically distinct from populations in the San Juan Islands and the rest of the Georgia Basin.

NMFS also analyzed habitat characteristics for copper rockfish to determine if Puget Sound copper rockfish occupied a unique setting within the biological species as a whole. Puget Sound and the greater Georgia Basin are of recent post-glacial origin. The geological history and present day physical characteristics may affect rockfish colonization and movement. NMFS found that the long and sinuous water bodies, shallow sills, and estuarine current patterns that characterize the Puget Sound may limit larval movements into and out of different basins. For example, one study examined circulation patterns between North Puget Sound and South Puget Sound using drift cards (T. Klinger, University of Washington, pers. comm. cited in NMFS, 2001a). The study indicated that virtually nothing on the surface enters the main basin of Puget Sound from the San Juan Islands or Eastern Basin of the Strait of Juan de Fuca. However, general circulation studies identified some mixing of subsurface waters near the sills, so limited exchange is possible. Freshwater inputs differ among the regions of the Georgia Basin and between the Basin and the outer coast, suggesting that lower salinity could promote local adaptation and prevent foreign larvae from recruiting to those areas (NMFS, 2001a).

In addition, the life history traits of copper rockfish, such as the fact that they are live–bearing, use internal fertilization, have short pelagic larval stages, exhibit adult-specific fidelity to certain habitat, and may be physically isolated due to current conditions in Puget Sound, are evidence of isolating mechanisms that are consistent with the genetic information.

DPS Determination. NMFS concludes that the best available information indicates that copper rockfish populations are divided into a Puget Sound proper DPS, a Northern Puget Sound DPS, and a coastal DPS. The Puget Sound proper DPS encompasses the populations in the body of water east of Deception Pass and to the south and east of Admiralty Head–encompassing Southern Puget Sound, Whidbey Basin, Hood Canal, and the Main Basin. The Northern Puget Sound DPS comprises populations in the San Juan Islands, the Strait of Juan de Fuca, and the Canadian Gulf Islands. The provisional boundaries of this DPS extend to an uncertain degree further north into the rest of the Georgia Basin. The coastal DPS consists of populations from California to Alaska and has a provisional boundary at Cape Flattery with the Northern Puget Sound DPS.

NMFS considered several DPS configurations for copper rockfish in the northeastern Pacific Ocean in attempting to identify ''discrete'' and ''significant'' segments of the biological species that incorporates Puget Sound populations. The considerable genetic evidence shows significant reproductive isolation between the Puget Sound proper DPS, the Northern Puget Sound DPS, and the coastal DPS. Rockfish life history traits and Puget Sound's unique habitat characteristics further support these DPS configurations. Although some genetic data suggest that multiple populations may exist within the Northern Puget Sound DPS, NMFS believes that there is not enough evidence to support geographically smaller DPSs.

Quillback Rockfish

NMFS reviewed a number of genetic studies to determine whether the Puget Sound populations are reproductively isolated from the coastal populations (or each other). One study examined specimens from California, Washington, and Alaska, including five locations within the Georgia Basin (Seeb, 1998). Allele frequencies were remarkably different between Puget Sound proper and even the closest location (San Juan Islands). Another study compared two sites in the Puget Sound with populations in the San Juan Islands, WA, Sitka, AK, and Prince William Sound in Alaska (P. Wimberger, UPS, pers. comm. cited in NMFS, 2001a). The genetic differences increased with greater geographic distance. The genetic information also indicated that the San Juan Islands population was more similar to the Sitka population than the Puget Sound population. The study supported the conclusions of Seeb's (1998) genetic research.

In addition to the genetic information, NMFS reviewed the habitat characteristics for quillback rockfish to determine if Puget Sound quillback rockfish occupied a unique setting within the biological species as a whole. The habitat characteristics contributing to copper rockfish reproductive isolation are also considered isolating mechanisms for quillback rockfish. And, as with copper rockfish, quillback rockfish life history traits are evidence of isolating mechanisms that are consistent with the genetic information.

DPS Determination. NMFS concludes that the best available information indicates that quillback rockfish populations are divided into a Puget Sound proper DPS, a Northern Puget Sound DPS, and a coastal DPS. The Puget Sound proper DPS comprises populations east of Deception Pass and to the south and east of Admiralty Head. The Northern Puget Sound DPS consists of populations in the San Juan Islands, the Strait of Juan de Fuca, and the Canadian Gulf Islands. The provisional boundaries of this DPS extend to an uncertain degree further north into the rest of the Georgia Basin. The coastal DPS consists of populations from California to Alaska and has a provisional boundary at Cape Flattery with the Northern Puget Sound DPS.

NMFS considered several DPS configurations for quillback rockfish in the northeastern Pacific Ocean in attempting to identify ''discrete'' and

''significant'' segments of the biological species that incorporates Puget Sound populations. The considerable genetic evidence shows significant reproductive isolation between the Puget Sound proper DPS, the Northern Puget Sound DPS, and the coastal DPS. Rockfish life history traits and the Puget Sound's unique habitat characteristics further support these DPS configurations. While there are presently very few data and many uncertainties regarding the exact northern boundary of the Northern Puget Sound DPS, NMFS believes that the best available information does not support grouping this DPS with a larger coastal DPS.

Brown Rockfish

To determine whether the petitioned Puget Sound populations are distinct from other Georgia Basin or coastal populations, NMFS examined genetic studies to determine if they were reproductively isolated. As with copper rockfish, Seeb (1998) analyzed allozyme patterns and microsatellite DNA to compare two Puget Sound locations with California samples. The allozyme frequencies differ significantly between the Puget Sound population and the California population.

Brown rockfish life histories and habits differ from those of quillback and copper rockfish; however, the habitat characteristics and key life history traits that contribute to their isolation are found among brown rockfish as well (i.e., they are live-bearing, use internal fertilization, and have short pelagic larval stages).

In 1987, trawl surveys detected brown rockfish in Northern Puget Sound, but no brown rockfish were collected in subsequent surveys (W. Palsson, WDFW, pers. comm. cited in NMFS, 2001a). Video-Acoustic Technique (VAT) surveys did not detect brown rockfish in Northern Puget Sound in 1994 or 1995, but small numbers were detected in the Strait of Juan de Fuca in 1996 (Pacunski and Palsson, 1998). Brown rockfish are considerably rare or non-existent off the coasts of Washington and Oregon, however they are relatively common in California. This large disjunction indicates that the Puget Sound populations inhabit an ecologically unique habitat. In addition, current conditions in Puget Sound also provide a physical isolating mechanism that is consistent with the genetic information.

DPS Determination. NMFS concludes that the best available information indicates that brown rockfish populations are divided into a Puget Sound proper DPS and a coastal DPS. The Puget Sound proper DPS comprises those populations in the the body of water east of Deception Pass and to the south and east of Admiralty Head. The coastal DPS encompasses populations from California to Alaska although the extent of the DPS is unknown.

NMFS considered several DPS configurations for brown rockfish in the northeastern Pacific Ocean in attempting to identify a ''discrete'' and ''significant'' segment of the biological species that incorporates Puget Sound populations. The genetic evidence shows significant reproductive isolation between the Puget Sound proper DPS and the coastal DPS. Rockfish life history traits and the Puget Sound's unique habitat characteristics further support these DPS configurations. Unlike copper and quillback rockfish, brown rockfish do not appear to reside in Northern Puget Sound and the Strait of Georgia. Although brown rockfish are occasionally found in Washington coastal and inland waters outside of Puget Sound proper (i.e., east of Cape Flattery), information suggests that these individuals are vagrants from the Puget Sound proper DPS.

Pacific Herring

As previously noted, the WDFW recognizes 18 spawning populations of Pacific herring in Puget Sound; these are based on spawn timing and location: (1) Squaxin Pass, (2) Quartermaster Harbor, (3) Port Orchard-Port Madison, (4) South Hood Canal, (5) Quilcene Bay, (6) Port Gamble, (7) Kilisut Harbor, (8) Port Susan, (9) Holmes Harbor, (10) Skagit Bay, (11) Fidalgo Bay, (12) Samish Bay-Portage Bay, (13) Interior San Juan Islands, (14) Northwest San Juan Islands, (15) Semiahmoo Bay, (16) Cherry Point, (17) Discovery Bay, and (18) Dungeness Bay (Lemberg et al., 1997; O'Toole *et al.*, 2000). Koenigs (2000) supplied updated information indicating that spawning Pacific herring were found in Wollochet Bay in 2000, suggesting a 19th spawning population in Puget Sound. The Canada Department of Fisheries and Oceans (DFO) recognizes multiple spawning aggregates in the Strait of Georgia but manages them as one population.

NMFS reviewed a number of genetic studies to determine whether the petitioned Puget Sound populations are distinct from each other (or from coastal and Northern Georgia Basin populations). Genetic studies indicate no significant differences in allele frequencies between samples from the Puget Sound and the Washington coast (Utter, 1972). Samples collected from Oregon to Kodiak Island, Alaska, did not suggest significant genetic differentiation among these populations either (Utter *et al.*, 1974). However, studies did indicate reproductive isolation between the Asian-Bering Sea populations and the populations in the eastern North Pacific (Grant and Utter, 1984; Kobayashi, 1993; Seeb *et al.*, 1999).

NMFS analyzed tagging studies to determine the amount of spawning-site fidelity within the populations. Although there were few available tagging data from fish spawning in Puget Sound, tagging data from British Columbia populations indicated various degrees of spawning-site fidelity among different spawning locations. However, the same studies also showed movement into other known spawning areas in the Georgia Basin. These results indicate that there is sufficient migration to support genetic homogeneity among the distinct spawning aggregates, indicating a larger genetic population structure than the petitioner suggested.

Larval distribution studies in the Queen Charlotte Islands, North Coast of British Columbia, and Strait of Georgia management regions indicate that Pacific herring larvae mix extensively outside of natal spawning locations but tend to remain within the regional boundaries (Hay and McCarter, 1997). Extensive larval mixing within regions indicates that Pacific herring population structure is established at early life-history stages and is independent of the exact spawning location. The studies also substantiate the idea that natural barriers and current-induced gyres act as larval retention mechanisms in the Strait of Georgia, indicating that the Strait of Georgia population is largely reproductively isolated from the coastal populations. There were no studies of this type for the Puget Sound populations. However, the available evidence supports the hypothesis that there is enough intermingling between distinct spawning aggregates to define a population structure that is larger than Puget Sound.

NMFS also looked at morphometric and meristic differences to further evaluate population discreteness. Several morphometric and meristic characters showed detectable differences between Strait of Georgia Pacific herring populations and those in northern British Columbia (Meng and Stocker, 1984). Southern Puget Sound populations had different average vertebral counts from those found in the Pacific herring population whose spawning aggregation was closer to the open ocean (Katz, 1942), and average vertebral counts from British Columbia populations were notably different from those exhibited by California (Thompson, 1917) and Alaska

populations (Rounsefell, 1929; Rounsefell, 1930). There was not enough morphometric or meristic information to support a Puget Sound DPS; however, the data do indicate that inshore populations are detectably different from coastal populations.

NMFS analyzed other available information regarding the reproductive isolation of Puget Sound Pacific herring but found no evidence of discreteness to support a Puget Sound DPS. For example, though populations of Pacific herring sampled in Puget Sound and British Columbia showed significant differences in growth rate and length at various year classes (Trumbull, 1980; Gonyea and Trumble, 1983; Ware, 1985; Schweigert, 1991; O'Toole, 2000), these differences may simply be because some of the resident herring grow more slowly than migratory herring due to poorer food production in the nearshore environment (Ware, 1985). Several studies indicated Pacific herring fecundity differences at given lengths over large geographic distances, but this is because fecundity at a particular length decreases with an increase in latitude and the concomitant decline in environmental temperature (Paulson and Smith, 1977; Hay, 1985; Lassuy, 1989). Pacific herring in the north ultimately grow much larger, live longer, and consequently produce more ova than Pacific herring in the south (Katz, 1948). There was insufficent parasitological or age at maturity information to show whether the Puget Sound population is structured on a finer scale.

NMFS also looked at Pacific herring habitat characteristics to determine if the populations in the Georgia Basin occupied a unique setting within the biological species as a whole. NMFS finds that the habitat characteristics contributing to rockfish isolation also isolate Pacific herring in the Georgia Basin.

DPS Determination. NMFS concludes that the Pacific herring populations identified by the petitioner do not constitute a ''species'' under the ESA, but are part of a larger Georgia Basin Pacific herring DPS that consists of inshore populations from Puget Sound and the Strait of Georgia. This DPS encompasses the 18 spawning populations in Puget Sound and the Strait of Georgia populations recognized by the WDFW and DFO.

NMFS considered several DPS configurations for Pacific herring in the northeastern Pacific Ocean in attempting to identify ''discrete'' and ''significant'' segments of the biological species that incorporates Puget Sound populations. Evidence that NMFS looked at appeared contradictory, such as (1) observed rates of straying of adult and juvenile Pacific herring and the lack of consistent genetic differentiation among regional populations, and (2) the consistency of timing and specific spawning locations. However, this evidence is consistent with the metapopulation concept that has been used to describe stock structure of Atlantic herring (McQuinn, 1997). The metapopulation concept shows that distinct populations can exhibit these types of discreteness and mixing by explaining that larger populations are made up of smaller local breeding populations that interact genetically and ecologically (National Research Council, 1995).

Status of Copper, Quillback, and Brown Rockfish and Pacific Herring DPSs

In considering whether these DPSs should be listed as threatened or endangered under the ESA, NMFS evaluated both qualitative and quantitative information. The qualitative evaluations included recent, published assessments by a variety of sources, and the quantitative assessments were based on current and historical abundance information and time series data compiled principally by fisheries agencies in Washington and Canada. NMFS focused on information and risk assessments pertaining to those rockfish and herring DPSs containing the petitioned populations within Puget Sound, i.e., the coastal DPSs for rockfish were not evaluated as they were outside the scope of the petition.

General Risk Factors for Rockfish

In general, recreational rockfish harvest rates showed a precipitous decline in Puget Sound proper from 1.01 fish/trip in 1977 to approximately 0.50 fish/trip in 1994. After 1994, the catch rates dropped to between 0.27 and 0.30 fish/trip and remained there (W. Palsson, WDFW, pers. comm. cited in NMFS, 2001a). Catch rates after 1994 may have become stable because the bag limit was reduced from five to three rockfish in Puget Sound proper. The percentage of brown rockfish in the catches declined through the 1980s and mid-1990s, but increased in the late 1990s. The recreational catch composition of copper and quillback rockfish was about the same from 1980 to 1989, however there was a noticeable decline of quillback rockfish in 1996. Declines in catch rates and relatively high densities of rockfish in unfished marine protected areas indicate that harvesting has affected population size.

The catch per trip of all rockfish species in Northern Puget Sound from 1980 to 1999 fluctuated between 0.6 and 1.2 with no apparent trend after a decline from higher levels (1.2 to 1.8) in the late 1970s. In 1980, copper rockfish constituted 30 percent of the recreational catch of rockfish in this area. The composition of copper rockfish fluctuated from 32 to 65 percent between 1984 and 1999. Copper rockfish remain common in Northern Puget Sound, making up 30 to 60 percent of the recreational catch, although fishery data indicate that they have declined. From 1980 to 1999, quillback rockfish constituted 20 to 40 percent of the recreational catch of rockfish in this area, and the trend has decreased over time. In 1994, the bag limit was reduced from 10 to five rockfish in Northern Puget Sound to reduce fishing mortality.

Richards and Cass (1987) reported decreases in the rockfish population in the Strait of Georgia, with overharvest cited as the major factor. Subsequently, the catch per effort of the copper and quillback rockfish complex has declined moderately in the Queen Charlotte Strait, Campbell River area, and Gulf Islands.

Nearshore nursery habitat degradation and shoreline modification may decrease juvenile rockfish survival. Early life stages usually settle into intertidal/subtidal habitats, commonly associated with eelgrass and kelp beds, and these habitats have declined in both extent and quality in the Puget Sound (West, 1997). Studies indicate that rockfish are not major components of pinniped diets (Everitt *et al.*, 1981) but are an important prey item for the Oregon Coastal common murre (*Uria aalge*) (Wiens and Scott, 1975). However, according to Mahaffy *et al.* (1994), the populations of common murre in the Georgia Basin are quite small. Similarly, it is unclear how changes in the abundance of other fish species may affect rockfish populations in Puget Sound.

Heavy metals, pesticides, and other contaminants in the concentrations occurring in Puget Sound may be toxic to rockfish. Studies confirm that rockfish accumulate certain chemicals in urban areas of the Georgia Basin (Malins *et al.*, 1982; West *et al.*, 1998; Puget Sound Water Quality Action Team, 2000; G. Ylitalo, NMFS, and J. West, WDFW, unpublished data). It has not yet been established what levels of contaminants are likely to affect rockfish health. Research investigating the effects of contaminants on other species in Puget Sound show sublethal effects that include biochemical alterations and effects on growth, reproductive function, larval growth

and survival, embryonic malformation, and disease resistance (Meador, 2000; Beckvar *et al.*, 1996). However, the effects of contaminants on rockfish are unclear.

Puget Sound Proper Copper Rockfish DPS

Population assessments for copper rockfish based on VAT surveys estimated that there were approximately 450,000 copper rockfish in Puget Sound proper (average) between 1993 and 1996 (Pacunski and Palsson, 1998). Palsson (WDFW, pers. comm., cited in NMFS, 2001a) provided information indicating that copper rockfish are dispersed throughout Puget Sound; however, he noted that there were a number of cases where VAT surveys did not detect the species in areas containing suitable habitat. Self-Contained Underwater Breathing Apparatus (SCUBA) surveys conducted in the Main Basin of Puget Sound in 1987 and 1988 showed an average of 42 copper rockfish per 270 m^2 transect (Matthews, 1990). Surveys conducted between 1995 and 1997 showed approximately six copper rockfish per 270 m^2 transect in similar transects (W. Palsson, WDFW, pers. comm. cited in 2001a).

Bottom trawl surveys were conducted annually in the Main Basin of Puget Sound between 1987 and 1995 (W. Palsson, WDFW, pers. comm. cited in NMFS, 2001a). Copper rockfish abundance was estimated at 183,000 in 1987 and rose to 1,010,000 in 1989. Abundance since 1989 declined to 35,000 in 1995. Changes in survey methodology and seasonality may have contributed to some of these apparent changes in abundance.

Copper rockfish egg production was estimated from 1975 to 1999 using data from recreational catch surveys. Relative egg production peaked in 1977 and declined rapidly through the 1980s (W. Palsson, WDFW, pers. comm. cited in NMFS, 2001a). During the 1990s, egg production was somewhat constant ranging from 10.5 to 28.7 percent of peak production in South Puget Sound. The decrease in egg production coincides with the considerable decline in copper rockfish abundance.

As noted previously, NMFS has found that this DPS consists of populations in waters east of Deception Pass and to the south and east of Admiralty Head. Although populations of this species have declined over the last four decades with over-harvesting a likely major factor, the populations have appeared stable over the last 5 years. Further, the reductions in the recreational fishery bag limit and voluntary establishment of some no-take marine reserves have reduced current levels of fishing mortality. In addition, the lower population numbers in this DPS compared to the larger numbers in northern Puget Sound are roughly in proportion to the greater amounts of kelp and high relief habitat in Northern Puget Sound. Therefore, NMFS concludes that the Puget Sound proper copper rockfish DPS is not presently in danger of extinction nor is it likely to become so in the foreseeable future.

Northern Puget Sound Copper Rockfish DPS

As discussed previously, Pacunski and Palsson (1998) reported on VAT surveys conducted in Puget Sound. In 1994, the populations of copper rockfish in the San Juan Islands and Strait of Juan de Fuca were estimated at approximately 2,000,000 and 530,000 fish, respectively. Surveys in 1996 yielded no significant difference from the 1994 estimates.

In addition, the WDFW conducted trawl surveys annually in North Puget Sound between 1987 and 1995 to determine population trends (Palsson pers. comm. cited in NMFS, 2001a). Copper rockfish abundance was estimated at 72,000 in 1987 and decreased to 17,000 in 1995. Length frequency data from the recreational fishery catch show a decline in the average length because there was a reduction in the number of fish greater than 45 cm; however most of the decline occurred before 1985. Copper rockfish egg production from 1975 to 1999 was similar to egg production in Puget Sound proper (Palsson pers. comm. cited in NMFS, 2001a).

As noted previously, NMFS has found that this DPS comprises populations in the San Juan Islands, the Strait of Juan de Fuca, and the Canadian Gulf Islands with a provisional boundary extending to an uncertain degree further north into the rest of the Georgia Basin. It is apparent that copper rockfish persist throughout the range of this DPS and that their abundance in Northern Puget Sound is substantial (two million in the VAT survey). The populations in this DPS do not exhibit dramatic downtrends in most of the indicators for this area, but there are not enough data to quantitatively assess and project the trends in the population. Further, the reductions in the recreational fishery bag limit and voluntary establishment of some no-take marine reserves have reduced current levels of fishing mortality. Therefore, NMFS concludes that the Northern Puget Sound copper rockfish DPS is not presently in danger of extinction nor is it likely to become so in the foreseeable future.

Puget Sound Proper Quillback Rockfish DPS

VAT survey assessments between 1993 and 1996 showed approximately 300,000 quillback rockfish in Puget Sound proper (Pacunski and Palsson, 1998). Palsson (WDFW, pers. comm. cited in NMFS, 2001a) provided information indicating that quillback rockfish are dispersed throughout Puget Sound; however, he noted that there were a number of cases where VAT surveys did not detect the species in areas containing suitable habitat.

SCUBA surveys conducted between 1987 and 1997 in the Main Basin of Puget Sound have shown a substantial decline in the densities of quillback rockfish. Densities in 1987 and 1988 showed an average of 181 quillback rockfish per 270 m2 transect (Matthews, 1990). Surveys conducted between 1995 and 1997 showed approximately 28 quillback rockfish per 270m2 transect. However, the trawl surveys conducted annually in the Main Basin of Puget Sound between 1987 and 1995 depict a more stable trend in the estimated abundance. These surveys yield estimated abundances of quillback rockfish in 1987 and 1989 of 1,153,000 and 1,055,000, respectively. In 1991, this value declined to 668,000 and gradually increased to 766,000 in 1995 (W. Palsson, WDFW, pers. comm. cited in NMFS, 2001a).

As noted previously, NMFS has found that this DPS consists of populations in waters east of Deception Pass and to the south and east of Admiralty Head. Although 1997 SCUBA surveys show that quillback rockfish are at 15 percent of their 1987-1988 population level, the VAT and trawl surveys depict a more stable population over the last 5 years. In addition, the reductions in the recreational fishery bag limit and voluntary establishment of some no-take marine reserves have reduced current levels of fishing mortality. Moreover, the lower population numbers in this DPS compared to the larger numbers in northern Puget Sound are roughly in proportion to the greater amounts of kelp and high relief habitat in Northern Puget Sound. Therefore, NMFS concludes that the Puget Sound proper quillback rockfish DPS is not presently in danger of extinction nor is it likely to become so in the foreseeable future.

Northern Puget Sound Quillback Rockfish DPS

The WDFW conducted trawl surveys annually in Northern Puget Sound (San Juan Islands and the Strait of Juan de Fuca) between 1987 and 1995 to determine population trends (Palsson,

pers. comm. cited in NMFS, 2001a). Estimated quillback rockfish abundance from these surveys was 30,000 in 1987 and fluctuated from 363,000 in 1989 to 123,000 in 1991. In 1995, the species' abundance was estimated at 42,000 fish. However, VAT surveys conducted in Puget Sound between 1993 and 1996 give a different indication about the relative abundance of quillback rockfish in Northern Puget Sound (Pacunski and Palsson, 1998). In 1994, the population of quillback rockfish was estimated at approximately 1,000,000 fish, while 1996 surveys yielded estimates closer to 141,000 fish.

As noted previously, NMFS could not identify a definitive northern boundary for this DPS, but believes that it extends to an uncertain degree north into the Georgia Basin. There are not enough data to quantitatively assess the extinction risk of the Northern Puget Sound quillback rockfish DPS. However, it is apparent that the species persists throughout the range of this DPS and its abundance in Northern Puget Sound is substantial (i.e., estimated at one million fish in the VAT survey). The populations in this DPS lack a dramatic downtrend in most of the indicators for this area. Further, the reductions in the recreational fishery bag limit and voluntary establishment of some no-take marine reserves have reduced current levels of fishing mortality. Therefore, NMFS concludes that the Northern Puget Sound quillback rockfish DPS is not presently in danger of extinction nor is it likely to become so in the foreseeable future.

Puget Sound Proper Brown Rockfish DPS

VAT survey assessments between 1993 and 1996 estimated approximately 98,000 brown rockfish in Puget Sound proper (Pacunski and Palsson, 1998). The SCUBA surveys conducted between 1987 and 1997 in the Main Basin of Puget Sound show a steady increase in brown rockfish densities. In 1987, densities were 2.5 fish per 270 m^2 transect, whereas in 1997 there were more than 18 fish per transect.

The trawl surveys conducted annually in the Main Basin of Puget Sound between 1987 and 1995 (W. Palsson, WDFW, pers. comm. cited in 2001a). The estimated abundance of brown rockfish in 1987 was 761,000. This value declined to 23,000 in 1991 and rose slightly to 30,000 in 1995. Marine Recreational Fisheries Statistics Surveys show variable recreational catches ranging from 800 to 6,000 fish between 1996 and 1999 in Puget Sound proper. The highest catch rates were in 1997 and 1999.

As noted previously, NMFS has found that this brown rockfish DPS consists of populations in waters east of Deception Pass and to the south and east of Admiralty Head. Available evidence indicates (1) an increased abundance of brown rockfish in central Puget Sound during the late 1990s, (2) a stable population size in the Main Basin of the Puget Sound during the 1990s, and (3) increased relative percent of brown rockfish in the recreational catch composition during the late 1990s. In addition, the reductions in the recreational fishery bag limit and voluntary establishment of some no-take marine reserves have reduced current levels of fishing mortality. Moreover, brown rockfish are habitat generalists, making them more adaptable to the types of intertidal and subtidal habitats and associated food organisms available in the range of the DPS. Therefore, NMFS concludes that the Puget Sound proper brown rockfish DPS is not presently in danger of extinction, nor is it likely to become so in the foreseeable future.

General Risk Factors for Pacific Herring

NMFS looked at a number of factors that are potential risks to Pacific herring populations in the Georgia Basin. While there are data on some risk factors, others are not well documented or only suspected to be factors for decline. Examples of the latter include habitat alterations in Puget Sound that reduced the amount of eelgrass (a probable preferred spawning habitat). Pacific herring are prey for many marine birds, but predator consumption estimates were not available. The chemical contaminants that potentially affect rockfish are also considered potential risks to Pacific herring. Many of these contaminants have known negative effects on aquatic organisms; however, their effects on the Pacific herring populations in Puget Sound are not known.

Birds and other animals prey on Pacific herring eggs but it is difficult to estimate their effect on egg mortality (Palsson, 1984). West (1997) also suggested that the increased abundance of Pacific hake (Merluccius productus) in offshore waters may be adversely affecting the Pacific herring populations. In addition, changes in spiny dogfish (*Squalus acanthias*) abundance and the release of yearling hatchery chinook salmon (*Oncorhynchus tshawytscha*) could account for some of the increased non-fishing mortality. The declines in some of the Puget Sound populations coincide with the recent warm/dry conditions in the Pacific Northwest. Similar conditions occurred during the 1930s when Chapman *et al.* (1941) reported that the Discovery Bay and Cherry Point populations were at low levels.

In contrast, NMFS was able to examine more quantitatively the possible effects of harvest and pinniped predation on Pacific herring in the Georgia Basin. For instance, harbor seal (*Phoca vitulina*) activity increased near schools of Pacific herring, consequently changing their schooling behavior (N. Lemberg, WDFW, pers. comm., cited in West, 1997). Harbor seals consumed an estimated 3,206 mt of Pacific herring in the Canadian portion of the Strait of Georgia during 1988, which represented 9.6 percent of the spawning biomass (Olesiuk *et al.*, 1990). Pacific herring constituted 32.4 percent of the area's harbor seal diet in 1988. NMFS (1997) estimated that harbor seals consumed 4,859 mt of Pacific herring in Washington inland waters during 1993, which represented 34.9 percent of the estimated spawning biomass for that year. California sea lions (*Zalophus californianus*) consumed an estimated 830 mt of Puget Sound Pacific herring per year (on average) between 1986 and 1994 (NMFS 1997).

Georgia Basin Pacific Herring DPS

The Pacific herring populations in Puget Sound reported by Bargmann (1998) as ''depressed'' or ''critical'' show a marked decline in biomass from 1973 to 1999. For instance, the Cherry Point population has historically been the largest Puget Sound population, estimated at 14,998 tons in 1973. Spawn deposition surveys showed that the biomass decreased to 1,266 tons in 1999 (K. Stick, WDFW, pers. comm. cited in NMFS, 2001b). The Discovery Bay stock, the largest Strait of Juan de Fuca population, was believed to be one of the largest populations in Washington waters. This population fluctuated between 697 tons and 3,220 tons from 1976 to 1993 (K. Stick, WDFW, pers. comm. cited in NMFS, 2001b). After 1993, the population dramatically declined to 199 tons in 1997; however, the 1999 trawl surveys showed an increase in biomass to 307 tons (K. Stick, WDFW, pers. comm. cited in NMFS, 2001b). The Port Susan and Port Orchard/Port Madison populations also exhibited distinct downward trends. However, the 1999 surveys showed an increase in the Port Orchard/Port Madison estimates from 489 tons to 1,900 tons (K. Stick, WDFW, pers. comm. cited in NMFS, 2001b).

Herring populations from other spawning sites within Puget Sound did not show the marked declines seen with

the four ''depressed'' or ''critical'' populations. Many of these populations appear stable and healthy. For instance, the Kilisut Harbor populations fluctuated from 279 tons in 1975 to 850 tons in 1999. The Quartermaster Harbor, Dungeness Bay, Skagit Bay, Fidalgo Bay, and Samish-Portage Bay populations experienced similar populations trends during that time period.

Biomass in the Canadian portion of the Strait of Georgia, estimated from spawn deposition surveys, did not show the severe downward trends observed for some of the Puget Sound populations. The population was at relatively high levels in recent years, fluctuating between 67,031 metric tons (mt) in 1990 to 83,450 mt in 1999 (Schweigert and Fort, 1999).

Recreational fishery landings in Puget Sound are insignificant, and commercial fishing for Pacific herring has not been allowed in Washington coastal waters west of the Strait of Juan de Fuca. In Puget Sound, the sac roe fishery closed in 1981, and was followed by a general purpose fishery closure in 1983. The spawn-on-kelp fishery began in 1990 and continued on a limited basis until 1996. A low level sport bait fishery continues, primarily in central and south Puget Sound. Commercial landings were historically modest and did not exceed 1,000 tons until 1958 and then remained above 1,000 tons until 1983 (K. Stick, WDFW, pers. comm. cited in NMFS, 2001b). Since then, landings have ranged from 1,076 tons in 1990 to 361 tons in 1998, which is well below peak landings of 7,171 tons in 1975 (K. Stick, WDFW, pers. comm. cited in NMFS, 2001b). Native American tribes have conducted a significant Pacific herring fishery in the past, but these efforts were curtailed in 1996 due to concerns about the species' declining abundance.

Bargmann (1998) reported that natural herring mortality rates increased significantly from 1976 to 1995. In addition, the number of age groups comprising the bulk of the populations decreased from five to two or three during this time period. While Pacific herring formerly lived to ages exceeding 10 years, fish older than 6 years are now rare (Bargmann, 1998). British Columbia populations did not exhibit a decrease in abundance of older fish comparable to the decrease in Puget Sound populations (Schweigert and Fort, 1999). However, weight at age has decreased in all major British Columbia populations since the mid- to late 1980s (Stocker and Kronlund, 1998), which is consistent with the decline observed for the Cherry Point population. Numbers of 3–year–old fish in the Cherry Point population were approximated for the 1971–1975 and 1996–1999 period. This study indicated a considerably higher recruitment of 3–year–old fish during 1971 to 1976 than in later years. Reduced recruitment of 3–year–old Pacific herring and increased non-fishery related losses of older fish appear to be the primary causes for declining biomass of the Cherry Point populations and, perhaps, other Puget Sound populations as well.

As noted previously, NMFS has found that this Pacific herring DPS consists of populations from Puget Sound and the Strait of Georgia. Therefore, NMFS' risk assessment included more populations than those addressed in the petition. The British Columbia populations do not appear to be declining or at the low levels observed for some of the Puget Sound populations. Consequently, the population declines apparent in Puget Sound do not appear to be widespread throughout the range of the DPS. Moreover, because of the moderate to high productivity of Pacific herring populations and their tendency to stray among spawning sites, there are reasonable possibilities for reversing declines of depleted populations in specific spawning sites. Therefore, NMFS concludes that the Georgia Basin Pacific herring DPS is not presently in danger of extinction nor is it likely to become so in the foreseeable future.

Determination

The ESA defines an endangered species as any species in danger of extinction throughout all or a significant portion of its range, and a threatened species as any species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Section 4(b)(1) of the ESA requires that the listing determination be based solely on the best scientific and commercial data available, after conducting a review of the status of the species and after taking into account those efforts, if any, that are being made to protect such species.

After reviewing the best available scientific and commercial information for these species, NMFS concludes that for the three rockfish species reviewed, petitioned populations comprise five DPSs under the ESA: (1) A Puget Sound proper copper rockfish DPS; (2) a Northern Puget Sound copper rockfish DPS; (3) a Puget Sound proper quillback rockfish DPS; (4) a Northern Puget Sound quillback rockfish DPS; and (5) a Puget Sound proper brown rockfish DPS. In addition, NMFS concludes that the petitioned populations of Pacific herring do not constitute a ''species'' under the ESA, but are part of a larger Georgia Basin Pacific herring DPS that consists of inshore populations from Puget Sound and the Strait of Georgia. After assessing the risk of extinction faced by each DPS, NMFS further determines that none of the rockfish or herring DPSs warrant listing as threatened or endangered at this time.

References

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

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

Dated: March 27, 2001.

William T. Hogarth,

Acting Assistant Administrator for Fisheries, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 600

[Docket No. 950616159–1055–05; I.D. 022601D]

RIN 0648–ZA16

Northeast Multispecies Fishery; Fishing Capacity Reduction Program

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

ACTION: Notice of proposed fishing capacity reduction program and request for comments.

SUMMARY: The Military Construction Appropriations Act for FY 2001 included an emergency supplemental appropriation for the Northeast multispecies fishery of $10.0 million. The emergency appropriation is intended to support a voluntary fishing capacity reduction program in the Northeast multispecies fishery (FCRP) that permanently removes multispecies limited access fishing permits. NMFS is considering a plan for distributing funds to permit holders in exchange for their permit forfeiture. This document suggests two methods for ranking bids (math programming or correlation with fishing capacity). NMFS is requesting comments on the most appropriate and cost-effective means to accomplish the FCRP's intended goal. NMFS also announces that it will be holding a series of meetings to discuss the program and receive comments and suggestions on implementation.