

termed Residents, Transients, and Offshore whales. All three of these forms are currently classified as the same biological species, *O. orca*. The three forms vary in morphology, ecology, behavior, group size, social organization, acoustic repertoire, and genetic characteristics. Behavioral evidence suggests that Offshore and Transient pods ("pods" are close-knit family groups ranging from 10 to 70 whales) rarely interact with the Resident pods. Although the Transient form overlaps extensively in range with the Resident form, genetic evidence suggests that the two forms do not interbreed. Furthermore, distinct feeding habits exist, with Transient killer whales primarily preying on other marine mammals and Residents primarily subsisting on fishes (little is known, however, about the habits of the Offshore form).

Resident whales in the North Pacific consist of the following groups: western North Pacific Residents; western Alaska Residents; southern Alaska Residents; eastern North Pacific Northern Residents; and eastern North Pacific Southern Residents. Eastern North Pacific Southern Residents occur in the inland waterways of southern British Columbia and Washington, including the Georgia Strait, the Strait of Juan de Fuca, and Puget Sound.

The abundance of the eastern North Pacific Southern Resident stock has declined 20 percent in the past 5 years (1996–2001), and the decline has been accompanied by changes in survival rates between age and sex categories. NMFS recently reviewed the status of these whales under the ESA and determined that the eastern North Pacific Southern Resident stock does not qualify as a "species" as defined in the ESA (NMFS, 2002). However, information gathered during the ESA status review, including population viability analyses, suggests that designating eastern North Pacific Southern Resident killer whales as a depleted stock under the MMPA may be warranted.

Estimates of Historical Stock Size

The true K and MNPL are unknown for eastern North Pacific Southern Resident killer whales. Furthermore, an empirical estimate of maximum historical abundance is not available. When the annual census of the population began in 1974, there were 71 whales in the population. This count, however, followed the period in the 1960s and early 1970s when at least 68 whales were removed or killed during capture operations for public display. Thus, a minimum historical abundance

could be estimated to be approximately 140 killer whales if total removals were limited to the 68 animals that were known to be killed or captured. Although reasonably accurate numbers of animals removed by live capture exist, the number killed by shooting or other human activity is unknown. Therefore, the historical abundance may have been much greater than 140 whales.

Lacking sufficient information to support a direct estimate of historical abundance, NMFS has examined indirect evidence for historical stock size. An initial inspection of genetic diversity seen in DNA data (Barrett-Lennard, 2000; Barrett-Lennard and Ellis, 2001) indicates that eastern North Pacific Southern Resident killer whales have nearly the same number of alleles as Northern Residents (28 versus 35), despite a much smaller sample size (8 versus 126). This is consistent with a hypothesis that Southern Residents may have recently been a much larger population. In other words, if Northern Residents can be viewed as representing the expected genetic diversity of populations of their size (214), then Southern Residents may have been a similar stock size in the recent past (NMFS, 2002).

Although there are no empirical estimates of the historical stock size for eastern North Pacific Southern Resident killer whales, the best available scientific information suggests a historical abundance of approximately 140–200 whales. Under the MMPA, a stock is depleted if its abundance is below MNPL, the lower bound of OSP. Using the inferred historical stock size of 140–200 eastern North Pacific Southern Resident killer whales as a proxy for K, the estimated MNPL for the stock would be 84–120 whales (60 percent of K). The 2001 abundance of 78 killer whales is below even the most conservative (lowest) estimate of MNPL for the stock.

NMFS completed a comprehensive status review under the ESA for this stock of killer whales. To supplement that status review, NMFS is now initiating a review of the status of the eastern North Pacific Southern Resident stock of killer whales under the MMPA. NMFS will augment the information obtained during its recent ESA status review with any other available information regarding the stock's abundance relative to its OSP to determine whether it warrants a depleted designation under the MMPA.

Information Solicited

To ensure that the review is comprehensive and is based on the best

available data, NMFS is soliciting information and comments from any interested person concerning the status of the eastern North Pacific Southern Resident stock. It is requested that data, information, and comments be accompanied by (1) supporting documentation such as maps, logbooks, bibliographic references, personal notes, or reprints of pertinent publications; and (2) the name of the person submitting the data, his/her address, and any association, institution, or business that the person represents. NMFS also seeks information on impacts on areas of significance to the eastern North Pacific Southern Resident stock that may be causing the decline or impeding the recovery of the stock; on potential conservation measures that may be useful in alleviating those impacts and rebuilding the stock; and on the potential economic impacts and the potential biological benefits of alternative conservation measures. This would include information on potential effects of whale watching on resident killer whales in Washington waters and measures that might be proposed to reduce or mitigate such effects.

References

A complete list of all cited references is available via the Internet (see Electronic Access) or upon request (see ADDRESSES).

Dated: June 7, 2002.

William T. Hogarth,

*Assistant Administrator for Fisheries,
National Marine Fisheries Service.*

[FR Doc. 02-16528 Filed 6-28-02; 8:45 am]

BILLING CODE 3510-22-S

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Parts 223 and 224

[Docket No. 020603138-2138-01; I.D. 042502B]

RIN 0648-ZB22

Endangered and Threatened Wildlife and Plants: 12-Month Finding for a Petition To List Southern Resident Killer Whales as Threatened or Endangered Under the Endangered Species Act (ESA)

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

ACTION: Status review; notice of determination.

SUMMARY: NMFS announces a 12-month finding for a petition to list Southern Resident killer whales (*Orcinus orca*) as threatened or endangered under the Endangered Species Act (ESA). After a review of the best available scientific and commercial information, the agency finds that listing the Southern Resident killer whales is not warranted at this time because these killer whales do not constitute a species, subspecies, or distinct population segment (DPS) under the ESA. NMFS will continue to seek new information on the taxonomy, biology, and ecology of these whales, as well as potential threats to their continued existence, and within 4 years will reassess the status of these whales under the ESA. NMFS is issuing an advance notice of proposed rulemaking to designate this stock of killer whales as depleted under the Marine Mammal Protection Act (MMPA).

DATES: The finding announced in this document was made on May 31, 2002.

ADDRESSES: The complete file for this finding, including comments and information submitted, is available for public inspection by appointment during normal business hours at the NMFS Protected Resources Division, 525 NE Oregon Street, Suite 500, Portland, OR, 97232-2737.

FOR FURTHER INFORMATION CONTACT: Dr. Thomas Eagle, Office of Protected Resources, Silver Spring, MD (301) 713-2322, ext. 105, or Mr. Garth Griffin, Northwest Regional Office, Portland, OR (503) 231-2005.

SUPPLEMENTARY INFORMATION:

Electronic Access

A list of references cited in this notice is available via the Internet at <http://www.nwr.noaa.gov>. Additional information, including the report of the NMFS Biological Review Team (BRT) and written comments from the Marine Mammal Commission and other co-managers, is also available at this Internet address.

Background

Section 4(b)(3)(B) of the ESA requires that, for any petition to revise the List of Endangered and Threatened Wildlife and Plants that presents substantial scientific and commercial information, NMFS must make a finding within 12 months of the date of receipt of the petition about whether the petitioned action is (a) not warranted, (b) warranted, or (c) warranted but precluded from immediate proposal by other pending proposals of higher priority. Upon making a 12-month finding, the agency must promptly

publish notice of such finding in the **Federal Register**.

On May 2, 2001, NMFS received a petition from the Center for Biological Diversity (CBD) and 11 co-petitioners (CBD, 2001a) to list Southern Resident killer whales as threatened or endangered and to designate critical habitat for them under the ESA. The petitioned whales consist of three pods (J, K, and L) whose range during the spring, summer, and fall includes the inland waterways of Puget Sound, Strait of Juan de Fuca, and Georgia Strait. The primary impetus behind the petition is a recent decline in these pods from 97 animals in 1996 to 78 animals in 2001. The petition highlighted key issues for NMFS' consideration, including: (1) Genetic, behavioral, and ecological evidence indicating that Southern Resident killer whales may be a DPS under the ESA; (2) population data documenting a recent decline in Southern Resident killer whales and analyses indicating that these whales may be at risk of extinction; and (3) an array of threats that may account for the decline in Southern Resident killer whales. On July 26, 2001, NMFS received additional information from the lead petitioner, including an updated population viability analysis and a report on the July 2001 census of Southern Resident killer whales returning to the inland waters of Washington and southern British Columbia (CBD, 2001b).

On August 13, 2001 (66 FR 42499), NMFS provided notice of its determination that the petition presents substantial information indicating that a listing may be warranted and that it would initiate a status review to determine if Southern Resident killer whales warrant listing under the ESA. To conduct the status review, NMFS formed a BRT comprising scientists from the agency's Alaska, Northwest, and Southwest Fisheries Science Centers. Because the ESA requires that NMFS make a listing determination based upon the best available scientific and commercial information, the agency solicited pertinent information on killer whales (66 FR 42499, August 13, 2001) and convened a meeting on September 26, 2001, to gather technical information from co-managers, scientists, and individuals having research or management expertise pertaining to killer whale stocks in the north Pacific Ocean. In addition, in March 2002, the BRT received comments from the Marine Mammal Commission and Washington, Tribal, and Canadian co-managers on a preliminary draft of the BRT's status review findings. These comments were evaluated by the BRT,

who then prepared a final status review document for Southern Resident killer whales (NMFS, 2002). The status review and other documents forming the administrative record for this finding are available on the Internet (see **Electronic Access**) or from NMFS (see **ADDRESSES**).

Biological Background

Killer whales are one of the most strikingly pigmented of all cetaceans, making field identification easy. Killer whales are black dorsally and white ventrally, with a conspicuous white oval patch located slightly above and behind the eye. A highly variable gray or white saddle is usually present behind the dorsal fin. Saddle shape varies among individuals, pods, and from one side to the other on a single animal. Sexual dimorphism occurs in body size, flipper size, and height of the dorsal fin. More detailed information regarding this species' distribution, behavior, genetics, morphology, and physiology is contained in the BRT's status review (NMFS, 2002).

Killer whales are classified as top predators in the food chain and the world's most widely distributed marine mammal (Leatherwood and Dahlheim, 1978; Heyning and Dahlheim, 1988). Although observed in tropical waters and the open sea, they are most abundant in coastal habitats and high latitudes. In the northeastern Pacific Ocean, killer whales occur in the eastern Bering Sea (Braham and Dahlheim, 1982) and are frequently observed near the Aleutian Islands (Scammon, 1874; Murie, 1959; Waite et al., 2001). They reportedly occur year-round in the waters of southeastern Alaska (Scheffer, 1967) and in the intracoastal waterways of British Columbia and Washington State (Balcomb and Goebel, 1976; Bigg et al., 1987; Osborne et al., 1988). There are occasional reports of killer whales along the coasts of Washington, Oregon, and California (Norris and Prescott, 1961; Fiscus and Niggol, 1965; Rice, 1968; Gilmore, 1976; Black et al., 1997), both coasts of Baja California (Dahlheim et al., 1982), the offshore tropical Pacific (Dahlheim et al., 1982), the Gulf of Panama, and the Galapagos Islands. In the western North Pacific, killer whales occur frequently along the Soviet coast in the Bering Sea, the Sea of Okhotsk, the Sea of Japan, and along the eastern side of Sakhalin and the Kuril Islands (Tomilin, 1957). There are numerous accounts of their occurrence off China (Wang, 1985) and Japan (Nishiwaki and Handa, 1958; Kasuya, 1971; Ohsumi, 1975). Data from the central Pacific are scarce. They have been reported off

Hawaii, but do not appear to be abundant in these waters (Tomich, 1986; Caretta *et al.*, 2001).

The killer whale is the largest species within the family Delphinidae. Various scientific names have been assigned to the killer whale (Hershkovitz, 1966; Heyning and Dahlheim, 1988). These various names can be explained by sexual and age differences in the size of the dorsal fin, individual variations in color patterns, and the cosmopolitan distribution of the animals. The genus *Orcinus* is currently considered monotypic with geographical variation noted in size and pigmentation patterns. Two proposed Antarctic species, *O. nanus* (Mikhalev *et al.*, 1981) and *O. glacialis* (Berzin and Vladimirov, 1982; Berzin and Vladimirov, 1983), both appear to refer to the same type of smaller individuals. However, due to significant uncertainties regarding the limited specimen data, these new taxa have not yet been widely accepted by the scientific community. Recent genetic investigations note marked differences between some forms of killer whale (Hoelzel and Dover, 1991; Hoelzel *et al.*, 1998; Barrett-Lennard, 2000; Barrett-Lennard and Ellis, 2001). A worldwide review of specimens is needed to document geographical variation in morphology.

Killer whales in the Eastern North Pacific region (which includes the petitioned whale pods) have been classified into three forms termed Residents, Transients, and Offshore whales. The three forms vary in morphology, ecology, behavior, and genetic characteristics, all of which play an important role in determining whether the monotypic species *O. orca* can be subdivided under the ESA.

Resident Killer Whales

Resident killer whales in the Eastern North Pacific are noticeably different from both the Transient and Offshore forms. The dorsal fin of Resident whales is rounded at the tip and falcate (curved and tapering). Resident whales have a variety of saddle patch pigmentation, with five different patterns recognized (Baird and Stacey, 1988a). Resident whales occur in large, stable pods with membership ranging from 10 to approximately 60 whales. Their presence has been noted in the waters from California to Alaska. The primary prey of Resident whales is fish. A recent summary of the differences between Resident and Transient forms is found in Baird (2000).

Resident killer whales in the North Pacific consist of the following groups: Southern, Northern, Southern Alaska, western Alaska and western North

Pacific Residents. Under the Marine Mammal Protection Act (MMPA), Residents are separated into two stocks: (1) The eastern North Pacific southern resident stock, which is the petitioned unit and (2) the eastern North Pacific northern resident stock, which includes the Northern (British Columbia) Residents, the Southern Alaska Residents, and the western Alaska Residents. The descriptions of the various units follows.

Southern Residents: The Southern Resident killer whale assemblage contains three pods, J pod, K pod, and L pod, and is considered a stock under the MMPA. Their range during the spring, summer, and fall includes the inland waterways of Puget Sound, Strait of Juan de Fuca, and Georgia Strait. Their occurrence in the coastal waters off Washington, Vancouver Island, and more recently off the coast of central California has been documented. Little is known about the winter movements and range of the Southern Resident stock. Southern Residents have not been seen to associate with other Resident whales. Genetic data indicate that females from the Southern and Northern Resident populations have not been migrating between populations within at least the recent evolutionary history of these populations, suggesting reproductive isolation between Southern and Northern Resident killer whale stocks (Hoelzel *et al.*, 1998; Barrett-Lennard, 2000; Barrett-Lennard and Ellis, 2001).

Northern Residents: The Northern Resident killer whale assemblage contains approximately 16 pods. They range from Georgia Strait (British Columbia) to Southeast Alaska (Ford *et al.*, 1994; Dahlheim, 1997). On occasion they have been known to occur in Haro Strait (west of San Juan Island, Washington). Although some overlap in range occurs between the Northern and Southern Residents, no intermixing of pods has been noted. However, in Southeast Alaska, Northern Resident whales are known to associate with Southern Alaska Residents (Dahlheim *et al.*, 1997), and there may be some gene flow between the two populations (Hoelzel *et al.*, 1998; Barrett-Lennard, 2000; Barrett-Lennard and Ellis, 2001).

Alaska Residents: There are two groups of Alaska Resident animals, Southern Alaska Residents and western Alaska Residents. The Resident whales of Southeast Alaska and Prince William Sound comprise the Southern Alaska Resident killer whale assemblage. At least 15 pods have been identified in these two regions. Resident killer whales photographed in Southeast Alaska travel frequently to Prince

William Sound and intermix with all Resident groups from this area (Dahlheim *et al.*, 1997; Matkin and Saulitis, 1997). Prince William Sound Resident whales have not been seen in Southeast Alaska, but have been noted off Kodiak Island intermixing with other, yet unnamed, Resident pods (Dahlheim, 1997; National Marine Mammal Laboratory, 2001). There are 241 animals photographed in western Alaska that have been provisionally identified as "Western Alaska Residents," but the number of pods represented is unknown (National Marine Mammal Laboratory, 2001). Recent vessel surveys in the southeastern Bering Sea have provided preliminary estimates of approximately 400 killer whales (Waite *et al.*, 2001). Although it is not yet known how many of these animals were Residents, killer whales occur both nearshore and offshore in the Bering Sea.

Western North Pacific Residents: Resident killer whales co-occur with salmon along the coasts of Washington, British Columbia, and Alaska. If this pattern continues (or historically continued) further to the west, then Resident killer whales may be expected to occur along the coastline of Russia and Japan. Although there is documentation of killer whales in these areas, little is known about whether they are more similar to Resident, Transient, or Offshore types.

Transient Killer Whales

There are several differences between Transient and Resident killer whales; these have most recently been summarized in Baird (2000). The dorsal fin of Transient whales tends to be more erect (i.e., straighter at the tip) than those of Resident and Offshore whales. Saddle patch pigmentation of Transient killer whales is restricted to three patterns (Baird and Stacey, 1988a). Pod structure is small (e.g., fewer than 10 whales) and dynamic in nature. Transient whales occur throughout the Eastern North Pacific with a preference toward coastal waters. Their geographical range overlaps that of the Resident and Offshore whales. Individual Transient killer whales have been documented to move great distances reflecting a large home range (Goley and Straley, 1994; National Marine Mammal Laboratory, 2001). The primary prey of Transient killer whales is other marine mammals. Transient whales are not known to intermingle with Resident or Offshore whales. Significant genetic differences occur among Resident, Transient, and Offshore killer whales (Stevens *et al.*, 1989; Hoelzel and Dover, 1991; Hoelzel

et al., 1998; Barrett-Lennard, 2000; Barrett-Lennard and Ellis, 2001). At this time, only one stock of Transient killer whales is recognized in eastern North Pacific waters, although recent genetic investigations indicate that up to three genetically different groups of Transient killer whales exist in the eastern North Pacific (the “west coast” Transients, the “Gulf of Alaska Transients” and AT1 pod) (Barrett-Lennard, 2000; Barrett-Lennard and Ellis, 2001).

Offshore Killer Whales

Offshore killer whales are similar to Resident whales (i.e., their fins appear to be more rounded at the tip). Most saddle patches appear to be closed (National Marine Mammal Laboratory, 2001). Offshore whales have been seen in groups ranging from 10 to 70 whales. They are known to range from central coastal Mexico to Alaska and occur in both coastal and offshore waters (300 miles off Washington State). While foraging, it is assumed that the main target is fish, but observational data on feeding events are extremely limited. Offshore whales are not known to intermingle with Resident or Transient whales. Genetic analysis suggests that Offshores may be reproductively isolated, but they appear to be more closely related to Southern Residents than to Northern Residents (Hoelzel *et al.*, 1998).

Consideration as a “Species” Under the ESA

The ESA defines a species to include “any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.” Guidance on what constitutes a DPS is provided by the joint NMFS-U.S. Fish and Wildlife Service interagency policy on vertebrate populations (61 FR 4722, February 7, 1996). To be considered a DPS, a population, or group of populations, must be “discrete” from other populations and “significant” to the taxon (species or subspecies) to which it belongs. A population segment of a vertebrate species may be considered discrete if:

- (1) It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological or behavioral factors. Quantitative measures of genetic or morphological discontinuity may also provide evidence of this separation; or
- (2) It is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist

that are significant under section 4(a)(1)(D) of the ESA.

If a population segment is considered discrete, NMFS must then consider whether the discrete segment is “significant” to the taxon to which it belongs. Criteria that can be used to determine whether the discrete segment is significant include:

(1) Persistence of the discrete population segment in an ecological setting unusual or unique for the taxon;

(2) Evidence that loss of the discrete population segment would result in a significant gap in the range of the taxon;

(3) Evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historical range; and

(4) Evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.

A population segment needs to satisfy only one of these criteria to be considered significant. Furthermore, the list of criteria is not exhaustive; other criteria may be used, as appropriate. As noted in the DPS policy, Congress has instructed NMFS and the U.S. Fish and Wildlife Service to use the authority to list a DPS “sparingly and only when the biological evidence indicates such action is warranted” (Senate Report 151, 96th Congress, 1st Session (1979)).

Defining a DPS Under Existing Killer Whale Taxonomy

Two types of genetic data that have been collected for killer whales have proven useful for identifying DPS boundaries in other species: microsatellite (nuclear) DNA and mitochondrial DNA (mtDNA). Each type of genetic data offers a unique and valuable perspective on the ecology and evolutionary history of killer whales. Microsatellite data are available for killer whales from seven populations: Southern Residents, Northern Residents, Southern Alaskan Residents, Gulf of Alaska Transients, west coast Transients, and AT1 Transients from Prince William Sound in Alaska. The magnitude of the genetic differences between Southern and Northern Residents was about half that found between Residents and Transients and about twice that found between Northern Residents and Southern Alaska Residents. These differences indicate that the Southern Resident, Northern Resident, and Alaska Resident populations are reproductively isolated populations and that the isolation of Southern and Northern Residents from each other is greater than the isolation

between Northern and Southern Alaska Residents. There may be some gene flow between the Northern Residents and Southern Alaska Residents (Hoelzel *et al.*, 1998; Barrett-Lennard, 2000; Barrett-Lennard and Ellis, 2001).

Two mtDNA sequences have been found in North Pacific Resident killer whales. The Southern Residents have one sequence and the Northern Residents have another that differs by one DNA nucleotide. Southern Alaska Residents have both sequences. Both males and females inherit the mtDNA of their mother, so these data indicate that females from the Southern and Northern Resident populations have not been migrating between populations within at least the recent evolutionary history of these populations.

The BRT recommended that Southern Residents meet the criterion for “discreteness” under the DPS policy based on genetics and other information. However, the consideration of “significance” was far more difficult, largely due to uncertainties surrounding killer whale taxonomy. Correctly identifying the killer whale taxon is critical because the criteria used to evaluate “significance” of a DPS are defined relative to other populations within that taxon. The BRT concluded that the current designation of one global species for killer whales is likely inaccurate because available data suggest that additional species/subspecies of killer whales probably exist.

In its consideration of “significance,” the BRT evaluated the importance of Southern Residents to the taxon represented by the currently recognized global species, *O. orca*. Based upon the following arguments, the BRT concluded that Southern Resident killer whales are not a DPS of the global species.

Persistence in an ecological setting that is unusual or unique for the taxon. The habitat used by Southern Resident killer whales is very similar to that of the neighboring Northern Resident population segment (coastal fjord system, significant freshwater input, seasonal availability of concentrations of salmon) though different from habitats that other populations of killer whales occupy globally. In addition, although Southern and Northern/Alaska Residents consume salmon from different oceanographic systems, this difference is quite minor when comparing Southern Resident killer whales foraging strategies with other killer whale foraging strategies on a global scale.

The petitioners suggested that Southern Resident killer whales occupy

a unique setting because the Puget Sound region is highly urbanized. Based upon the recommendation of the BRT, NMFS finds that this habitat difference is irrelevant to the ESA discussion because there is no evidence that Southern Residents have adapted in an evolutionary sense to urbanization in Puget Sound.

Loss would represent a significant gap in the range of the taxon. Because Transient killer whales are known to occupy the same range as Southern Resident killer whales and because Offshore killer whales may occupy a portion of the same range as Southern Resident killer whales, extinction of Southern Resident killer whales might not result in a gap in the range of the taxon. In addition, other Resident or Offshore animals could re-colonize the current range of Southern Residents should that population be extirpated.

Although it is plausible that the loss of Southern Resident killer whales could result in few, if any, killer whales in parts of Puget Sound for an extended period, killer whales would occupy their existing range from the Bering Sea through British Columbia. Furthermore, Transient and Offshore pods would continue to occupy other areas within the Pacific Ocean. NMFS, therefore, concluded that the potential gap that could result in the loss of Southern Residents would not be considered "significant" to the species.

The only surviving natural occurrence of a taxon. Because Southern Resident killer whales are clearly not a "discrete population segment representing the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range," the BRT did not consider this criterion from the DPS policy.

Evidence that the Southern Residents differ markedly from other populations in genetic characteristics. The BRT evaluated the genetic discreteness of Southern Resident killer whales in the context of genetic differences among all aggregations of killer whales globally. It found that the differences between Southern Residents and Resident pods in Canada and Alaska were small compared to genetic differences between Resident and Transient killer whale stocks. Consequently, the Southern Resident killer whale stock does not have markedly different genetic characteristics.

Southern Residents as a DPS Under Alternative Killer Whale Taxa

Although the BRT concluded that current killer whale taxonomy was outdated, the scientists acknowledged

that alternative taxa were not easily identified and noted that formal taxonomic changes would be slow to occur. In light of this, the BRT assessed which of several population units of killer whales might be designated as a putative taxon that would include Southern Resident killer whales if the global species were to be subdivided into two or more taxa.

The BRT supported about equally four different scenarios for alternative taxa: (1) North Pacific Resident killer whales; (2) North Pacific Resident and Offshore killer whales; (3) fish-eating killer whales worldwide; and (4) the entire mtDNA lineage that includes Resident and Offshore type killer whales. Despite the broad range of possible alternative taxa, the BRT did attempt to discern whether the Southern Resident population would qualify as a DPS with respect to each of these alternative taxonomic scenarios. Such information would be deemed useful if future changes in this species' taxonomy warranted reconsidering the ESA/DPS status of Southern Resident killer whales.

Within these four scenarios, the BRT expressed the strongest support for the proposition that Southern Residents would be a DPS of the Northern Pacific Residents (which included Southern, Northern, Alaska, and western North Pacific Resident killer whales). Support for Southern Residents as their own DPS diminished as the hypothesized taxon grew larger.

Risk Assessment Under Alternative Taxa

Upon concluding that the petitioned entity—Southern Resident killer whale—is not a DPS of the smallest taxon identified by the scientific community (i.e., the global species), the BRT could have ended its investigation. However, because the team members believed that current killer whale taxonomy is outdated, they continued their assessment beyond the narrow focus of the petition. Therefore, the BRT also investigated Southern Residents as a component of several potential DPS, and they examined various putative taxa of which Southern Residents would be a DPS. Then, the BRT conducted Population Viability Analyses (PVA) to estimate the probability of extinction for two of the smallest possible population units.

The first scenario analyzed was one for Southern Resident killer whales alone. As a continuation of the BRT's alternative taxa deliberations, this information would be considered useful if future changes in this species' taxonomy warranted reconsidering the

ESA/DPS status of Southern Resident killer whales. According to the PVA model results, Southern Residents would have a ≤ 10 percent probability of extinction in 100 years under the assumption that population declines seen from 1992 to 2001 continue into the future. Under the assumption that growth rates in the future would more accurately be predicted by the full (27-year) time series of data available, the model predicts that extinction probability is 1 to 5 percent in 100 years, with the higher values associated with higher probability and magnitude of catastrophic mortality events (e.g., oil spill). Again, these results pertain only to the smallest population assemblage containing Southern Residents, not to a recognized DPS. As such, they represent "worst case" estimates that are intended for comparison with other, larger aggregations.

The second scenario evaluated the extinction risk of a combination of Southern Residents and the closest population stock (identified under the MMPA), which is the eastern North Pacific Northern Resident stock (resident killer whales in British Columbia and Alaska). According to the model, the extinction risk over 100 years for this larger assemblage is negligible, and even larger aggregations are expected to yield similarly negligible extinction risks. Therefore, additional simulations were not conducted.

Conclusions of the BRT

Correctly identifying the killer whale taxon is critical because at least two of the criteria used to evaluate "significance" of a DPS are defined relative to other populations within that taxon. A population segment will qualify as a DPS if it occupies an "ecological setting unusual or unique for the taxon" or if "loss of the discrete population segment would result in a significant gap in the range of the taxon." The BRT concluded that the current designation of one global species for killer whales is likely inaccurate because available data suggest that present taxonomy does not reflect current knowledge and additional species/subspecies of killer whales should be "officially" recognized.

The BRT attempted to identify alternative taxa, but gave roughly equal support to four different scenarios. The taxon to which Southern Residents might belong if the global species were to be subdivided could be as small as North Pacific Resident killer whales or as large as the mtDNA lineage consistent with fish eating whales. The BRT

conducted PVA modeling on two population units of killer whales, Southern Residents along and in combination with Northern and Alaska Residents for comparative purposes. Although Southern Residents are not considered a DPS of the global species, they face a relatively high risk of extinction. The combination of Southern, Northern, and Alaska Residents, however, was at a very low risk of extinction. Thus, the manner by which killer whale taxonomy is resolved in the future will play a key role in determining whether there is a DPS to which Southern Resident killer whales belong and in evaluating the status of that DPS under the ESA.

As described previously in this notice, NMFS received comments on a preliminary draft of the BRT's status review findings from the Marine Mammal Commission and from Washington, Tribal, and Canadian co-managers. These comments included technical questions and data (e.g., recent census data for Northern Resident whales), discussions of DPS and listing policy issues, and information describing the cultural and spiritual importance of killer whales to Native American Tribes.

Some co-managers requested that NMFS use other DPS criteria for significance, such as the ecological role of Southern Resident killer whales in Puget Sound and Georgia Straits. The BRT discussed an array of criteria that may be useful for determining significance, including some not contained in the DPS policy but raised by the petitioners or co-managers. However, only the criteria described in the DPS policy were deemed applicable to assessing the significance of Southern Residents. Based on these criteria, the BRT concluded that Southern Resident killer whales are *not* a DPS of the global species. The criteria before the BRT for considering "significance" were sufficient to evaluate whether or not Southern Residents represented a DPS of killer whales. In the notice of joint policy regarding DPS determinations (61 FR 4722, February 7, 1996), NMFS and the U.S. Fish and Wildlife Service discussed the criteria for evaluating a portion of a species as a DPS. The Services noted that the ESA is not intended to establish a comprehensive biodiversity conservation program; rather, the ESA is focused on the protection and recovery of threatened and endangered species or population segments that are discrete and significant to the species and on the ecosystems upon which these particular species depend. In the 1996 policy notice, the Services responded to a

comment suggesting that the "significance" criteria include a consideration of the affected population's importance to the ecosystem it occupies. The Services noted that most, if not all, populations play a significant role in their ecosystems. The Services also stated, "On the other hand, populations commonly differ in their importance to the overall welfare of the species they represent, and it is this importance that the (DPS) policy attempts to reflect in the consideration of significance." NMFS concurs with other co-manager comments that the issue of classifying Southern Resident killer whales into a particular DPS cannot be resolved until the taxonomic structure of *O. orca* is clarified.

Finding

NMFS has reviewed the petition, the report of the BRT (NMFS, 2002), co-manager comments, and other available information, and has consulted with species experts and other individuals familiar with killer whales. On the basis of the best available scientific and commercial information, the agency finds that the petitioned action is not warranted at this time because the petitioned group of killer whales does not constitute a DPS of the currently recognized species *O. orca*.

The status review revealed uncertainties regarding the taxonomic status of killer whales worldwide. The taxonomy of killer whales that is currently published in the scientific literature includes a single species that includes all killer whales globally. The BRT discussed more recent, but inconclusive, evidence that *O. orca* could be separated from a single, global species into additional species or subspecies. In this case, NMFS recognized that taxonomists may be conservative or liberal in assigning new species and that the relevance of new information may be debated widely before it is generally accepted by the scientific community. Because the recent information related to the taxonomy of killer whales has not been subjected to that scientific debate, NMFS considers the published standard of a single, global species as the best available scientific information. In accordance with the report of the BRT, NMFS finds that Southern Resident killer whales are not a "species" under the ESA. Consequently, NMFS finds that listing Southern Resident killer whales as threatened or endangered is not warranted at this time.

As noted in the report of the BRT, NMFS also investigated alternatives to identify whether there is a DPS to which

Southern Residents may belong. Although a DPS could not be identified clearly, the BRT evaluated the risk of extinction of other larger potential DPSs by aggregating logical units. For a first logical step in aggregating units of killer whales, the BRT combined the Southern, Northern, and Alaska Residents and simulated the risk of extinction for this aggregation. Simulation results predicted that the extinction risk of that initial aggregation was negligible. Therefore, NMFS cannot identify a DPS to which Southern Residents may belong that is in danger of extinction throughout all or a significant portion of its range or likely to become endangered in the foreseeable future.

NMFS is, however, concerned about the recent decline in the Southern Resident assemblage, and will continue to seek new information on the taxonomy, biology, and ecology of these whales, as well as potential threats to their continued existence. Within 4 years, NMFS will reconsider the taxonomy of killer whales. If the species *O. orca* has been subdivided in a manner that may allow Southern Resident killer whales to be identified as a DPS, NMFS will reconvene a BRT to reassess the status of these whales under the ESA. Also, in light of new information presented in the recently completed status review and in response to some co-manager recommendations, the agency will review the status of Southern Resident killer whales to determine whether they warrant reclassification as a depleted stock under the MMPA. A request for information relevant to making this latter determination is being made via a concurrent notice in the **Federal Register**.

References

A complete list of all cited references is available on the Internet (see Electronic Access) or from NMFS upon request (see **FOR FURTHER INFORMATION CONTACT**).

Dated: June 7, 2002.

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[FR Doc. 02-16526 Filed 6-28-02; 8:45 am]

BILLING CODE 3510-22-S