DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[FWS–R2–ES–2008–0025 ; 92220–1113–0000–C6]

RIN 1018–AV28

Endangered and Threatened Wildlife and Plants; Removal of the Brown Pelican (Pelecanus occidentalis) From the Federal List of Endangered and Threatened Wildlife

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: Under the authority of the Endangered Species Act of 1973, as amended (Act), we, the U.S. Fish and Wildlife Service (Service), are removing the brown pelican (*Pelecanus occidentalis*) from the Federal List of Endangered and Threatened Wildlife due to recovery. This action is based on a review of the best available scientific and commercial data, which indicate that the species is no longer in danger of extinction, or likely to become so within the foreseeable future. The brown pelican will remain protected under the provisions of the Migratory Bird Treaty Act.

DATES: The effective date of this rule is December 17, 2009.

ADDRESSES: This final rule is available on the Internet at *http://www.regulations.gov and http://www.fws.gov/southwest/es/Library/.* Supporting documentation used in preparing this final rule will be available for public inspection, by appointment, during normal business hours, at the Service's Clear Lake Ecological Services Field Office, 17629 El Camino Real #211, Houston, Texas 77058–3051.

FOR FURTHER INFORMATION CONTACT: Steve Parris, Field Supervisor, U.S. Fish and Wildlife Service, Clear Lake Ecological Services Field Office, 17629 El Camino Real #211, Houston, Texas 77058–3051; telephone 281/286–8282; facsimile 281/488–5882. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Background

Brown pelican (*Pelecanus occidentalis*) populations currently listed under the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*) occur in primarily coastal marine and estuarine (where fresh and salt water intermingle) environments along the coast of the Gulf of Mexico from Mississippi to Texas and the coast of Mexico; along the Caribbean coast from Mexico south to Venezuela; along the Pacific Coast from British Columbia, Canada, south through Mexico into Central and South America; and in the West Indies, and are occasionally sighted throughout the United States (Shields 2002, pp. 2–4). Brown pelicans remain in residence throughout the breeding range, but some segments of many populations migrate annually after breeding (Shields 2002, p. 6). Overall, the brown pelican continues to occur throughout its historical range (Shields 2002, pp. 4–5). This rule includes biological and life history information for the brown pelican relevant to the delisting. Additional information about the brown pelican's biology and life history can be found in the Birds of North America, No. 609 (Shields 2002, pp. 1–36).

This rule applies to the entire listed species, which includes all brown pelican (*Pelecanus occidentalis*) subspecies. The species *Pelecanus occidentalis* is generally recognized as consisting of six subspecies: (1) *P. o. occidentalis* (Linnaeus, 1766: West Indies and the Caribbean Coast of South America, occasionally wanders to coasts of Mexico and Florida), (2) *P. o. carolinensis* (Gmelin, 1798: Atlantic and Gulf coasts of the United States and Mexico; Caribbean Coast of Mexico south to Venezuela, South America; Pacific Coast from southern Mexico to northern Peru, South America), (3) *P. o. californicus* (Ridgeway, 1884: California south to Colima, Mexico, including Gulf of California), (4) *P. o. urinator* (Wetmore, 1945: Galapagos Islands), (5) *P. o. murphyi* (Wetmore, 1945: Ecuador and Pacific Coast of Colombia), and (6) *P. o. thagus* (Molina, 1782: Peru and Chile). Recognition of brown pelican subspecies is based largely on relative size and color of plumage and soft parts (for example, the bill, legs, and feet). The distributional limits of the brown pelican subspecies are poorly known, so the geographic descriptions of their ranges are approximate and may not be adequate to assign subspecies designations. Additionally, some authors elevate the Peruvian subspecies to a separate species, Peruvian pelican (*P. thagus*) (*see* Remsen *et al.* 2009). However, the taxonomy of the brown pelican subspecies has not been critically reviewed for many years, and the classification followed by the American Ornithologists' Union (American Ornithologists' Union 1957, pp. 29–30) and by Palmer (1962, pp. 274–276) is based on Wetmore's (1945, pp. 577–586) review, which was based on few specimens from a limited portion of the range. Remsen et al. (2009) does not present a comprehensive taxonomic treatment of all brown pelicans, but rather, relies on already noted morphological differences to propose that *P. o. thagus* be recognized as a full species. Additional taxonomic review of all brown pelicans would be needed to further elucidate the relationships and distributions of the six described subspecies. The original listing of the brown pelican included the species throughout its range and covered all six of the subspecies described above. This rule continues that taxonomic treatment, including the Peruvian brown pelican (*P. o. thagus*).

Previous Federal Actions

On February 20, 2008, we published a 12-month petition finding and proposed rule to remove the brown pelican from the Federal List of Endangered and Threatened Wildlife (73 FR 9408). We solicited data and comments from the public on the proposed rule. The comment period opened on February 20, 2008, and closed on April 21, 2008. Note that this proposed rule addresses the status of brown pelicans throughout their range except where previously delisted along the Atlantic Coast of the United States, in Florida, and in Alabama (50 FR 4938; February 4, 1985). For more information on previous Federal actions concerning the brown pelican, please refer to the proposed rule published in the **Federal Register** on February 20, 2008 (73 FR 9408).

Distribution and Population Estimates

Information on population estimates below is arranged geographically for convenience and to present a logical organization of the information. These broad geographic areas do not necessarily represent populations or other biologically based groupings. The six subspecies described above are not used to organize the following information because distributional limits of the subspecies are poorly known, especially in Central and South America. Additionally, the broad overlap in wintering and breeding ranges among the subspecies introduces considerable uncertainty in assigning subspecies designations in portions of the species range (Shields 2002, p. 5). Because the brown pelican is a wide-ranging, mobile species, is migratory throughout much of its range, and may shift its breeding or wintering areas or distribution in response to local conditions, it is difficult to define local populations of the species. Much of the population estimate information below is given at the scale of individual countries, which may not correspond with actual biological populations, particularly for smaller countries that may represent only a fraction of the species' range. Direct comparison of all the estimates provided below is difficult because methods used to derive population estimates are not always reported, some population estimates are given as broad ranges, and some do not specify whether the estimates are for breeding birds or include nonbreeding birds as well. However, the information does indicate the broad distribution of the species and reflects the large global population estimate of more than 620,000 birds, which does not include previously delisted birds along the Atlantic coast of the United States, in Florida, or in Alabama (Service 2007a, pp. 44–45).

Gulf of Mexico Coast

Mississippi.—Turcotte and Watts (1999, pp. 84–86) consider the brown pelican a permanent resident of the Mississippi coast, even though there are no records of nesting brown pelicans in Mississippi. Brown pelicans are currently not known to breed in Mississippi, but the annual Christmas Bird Counts have documented wintering brown pelicans in Mississippi since 1985 (National Audubon Society 2009, pp. 1–3). The most recent counts over the winter of 2008–2009 sighted 372 brown pelicans (National Audubon Society 2009, p. 3).

Louisiana.—Before 1920, brown pelicans were estimated to have numbered between 50,000 and 85,000 in Louisiana (King *et al.* 1977a, pp. 417, 419). By 1963, the brown pelican had completely disappeared from Louisiana (Williams and Martin 1968, p. 130). A reintroduction program was conducted between 1968 and 1980. During this period, 1,276 nestling brown pelicans were transplanted from colonies in Florida to coastal Louisiana (McNease *et al.* 1984, p. 169). After the initiation of the reintroduction, the population reached a total number of 16,405 successful nests and 34,641 young produced in 2001 (Holm *et al.* 2003, p. 432).

In 2003, the number of nesting colonies increased, but numbers of successful nests decreased to 13,044 due to four severe storms that eroded portions of some nest islands and destroyed some late nests in various colonies (Hess and Linscombe 2003, Table 2). According to surveys conducted by the Louisiana Department of Wildlife and Fisheries (LDWF), the population appeared to recover from these impacts and a peak of 16,501 successful nests producing 39,021 fledglings was recorded in 2004 (LDWF 2006, p. 1; Hess and Linscombe 2006, p. 13). However, tropical storms in 2004 resulted in the loss of three nesting islands east of the Mississippi River and, after storm events in late 2005, LDWF surveys detected 25,289 fledglings (Hess and Linscombe 2006, p. 13). Surveys in 2006 detected 8,036 successful nests in 15 colonies, producing 17,566 fledglings with an average of 2.1 fledglings per successful nest (Hess and Linscombe 2007, pp. 1, 4). In 2007, there were 14 colonies that produced 24,085 fledglings with an average of 2.2 fledglings per nest (LDWF 2008, pp. 3, 6).

Hess and Linscombe (2007, p. 4) concluded that the brown pelican population in Louisiana is maintaining sustained growth despite lower fledgling production in 2005 and 2006 (a decrease of 31 percent from 2005 to 2006). Fledgling production has increased 37.1 percent from 2006 to 2007 (LDWF 2008, p. 5). Numbers of successful nests are not directly comparable to numbers of individuals in historic estimates because they do not account for immature or nonbreeding individuals or provide an index of population size in years when breeding success is low due to factors such as weather and food availability. However, numbers of successful nests and fledglings produced annually since 1993 (Hess and Linscombe 2007, p. 4; LDWF 2008, p. 4) do indicate continued nesting and successful fledging of young sufficient to sustain a viable population in Louisiana. See ''Storm effects, weather, and erosion impacts to habitat'' under Factor A for further discussion of effects of storms.

Texas.—Brown pelicans historically numbered around 5,000 in Texas but began to decline in the 1920s and 1930s, presumably due to shooting and destruction of nests (King *et al.* 1977a, p. 419). According to King *et al.* (1977a, p. 422), there were no reports of brown pelicans nesting in Texas in 1964 or 1966. There were two known nesting attempts in 1965, but the success of these nests is not known. Annual aerial and ground surveys of traditional nesting colonies conducted in Texas during the period 1967 to 1974 indicated that only two to seven pairs attempted to breed in each of these years. Only 40 young were documented fledging during this entire 8-year period (King *et al.* 1977a, p. 422).

The Texas Colonial Waterbird Census has tracked population trends in Texas for the brown pelican since 1973 (Service 2006, p. 5). Although the Texas population of brown pelicans did not experience the total reproductive failure recorded in Louisiana, the first year (1973) of information from the Texas census identified only one nesting colony with six breeding pairs in the State. Since that time, there was a gradual increase through 1993 when there were 530 breeding pairs in two nesting colonies; in 1994, there was a substantial increase to 1,751 breeding pairs in three nesting colonies (Service 2006, pp. 3–5). Since then, the overall increasing trend has continued with some year-to-year variation (Service 2006, pp. 2–3). The most recent complete count of breeding birds in Texas occurred in 2008 and reported 6,136 pairs (Service 2009c). This number equates to 12,272 breeding birds, which is substantially greater than historical population estimates for Texas.

Gulf Coast of Mexico.—Very little information is available about the status of the brown pelican along the Gulf Coast in Mexico. Aerial surveys indicated that brown pelicans in Mexico were virtually absent as a breeding species along the Gulf of Mexico north of Veracruz by 1968 (Service 1979, p. 10). An aerial survey conducted in March 1986 along this same stretch of coast counted 2,270 birds, down from 4,250 birds estimated in counts conducted between December 1979 and January 1980 (Blankenship 1987, p. 2). However, the counts in 1986 and in 1980 differed in the areas covered and timing of counts and represent only two data points, so it is difficult to compare the earlier and later counts. A recent survey of colonial waterbirds at Laguna Madre de Tamaulipas did not locate brown pelicans (Pronatura and Audubon Texas 2008), although brown pelicans were not sighted there during the 1986 aerial surveys either (Blankenship 1987, Table 1). No other recent information for this portion of the species' range was found, so no conclusions on population trends of the brown pelican for the Mexican portion of the Gulf Coast can be drawn.

Summary of Gulf of Mexico Coast.—Along the U.S. Gulf Coast, brown pelican populations, while experiencing some periodic or local declines, have increased dramatically from a point of near disappearance in the 1960s and 70s. Brown pelicans were present along the Gulf Coast of Mexico in 1986, but we currently lack recent information on the status of the species in this portion of its range.

West Indies

The West Indies refers to a crescent-shaped group of islands occurring in the Caribbean Sea consisting of the Bahamas, the Greater Antilles (including Cuba, Jamaica, Haiti, the Dominican Republic, and Puerto Rico), and the Lesser Antilles (a group of island countries forming an arc from the U.S. Virgin Islands on its northwest end southeast to Grenada). Van Halewyn and Norton (1984, p. 201) summarized the breeding distribution of brown pelicans throughout the Caribbean region and noted at least 23 sites where the species was reliably reported nesting in the islands of the West Indies at some time since 1950. Based on the most recent estimates available at the time, van Halewyn and Norton (1984, p. 201) documented more than 2,000 breeding pairs throughout the West Indies. More recently, Collazo *et al.* (2000, p. 42) estimated the minimum number of brown pelicans throughout the West Indies at 1,500 breeding pairs, and Bradley and Norton (2009, p. 275) estimated the West Indian population at 1,630 breeding pairs. Raffaele *et al.* (1998, pp. 224–225) describe the brown pelican as ''A common year-round resident in the southern Bahamas, Greater Antilles and locally in the northern Lesser Antilles east to Montserrat. It is common to rare through the rest of the West Indies with some birds wandering between islands.''

In a search for additional seabird breeding colonies in the Lesser Antilles, Collier *et al.* (2003, pp. 112–113) did not find brown pelicans nesting on Anguilla, Saba, and Dominica. In an attempt to survey seabirds in St. Vincent and the Grenadines, Hayes (2002, p. 51) found brown pelicans in the central Grenadines. He notes that brown pelicans were once considered common in the Grenadines and suggests that a small nesting colony may exist there, although there is no historical record of nesting.

Anguilla, Montserrat, Jamaica, the Bahamas, and Antigua.—Recent information presented in Bradley and Norton (2009, p. 275) reports 21 breeding pairs in Anguilla, 14 in Montserrat, greater than 150 in Jamaica, 50 in the Bahamas, and 53 in Antigua.

St. Maarten.—Collier *et al.* (2003, p. 113) reported finding two nesting colonies on St. Maarten Island in 2001, with a total of 64 nesting pairs, but in 2002 found no breeding pelicans at one of the two sites surveyed in 2001. Reasons for the lack of breeding activity in 2002 are unknown, although Collier *et al.* (2003, p. 113) suggested a disturbance event could have been the cause. The May 2006 newsletter for the Society for the Conservation and Study of Caribbean Birds (Society for the Conservation and Study of Caribbean Birds 2006) notes that St. Maarten's proposed Important Bird Areas of Fort Amsterdam and Pelikan Key host regionally important populations of nesting brown pelicans, although numbers of nesting birds are not given.

Puerto Rico and U.S. Virgin Islands.—Collazo *et al.* (1998, pp. 63–64) compared demographic parameters between 1980–82 and 1992–95 for brown pelicans in Puerto Rico. The mean number of individuals observed during winter aerial population surveys between 1980 and 1982 was 2,289, while mean winter counts from 1992 to 1995 averaged only 593 birds (Collazo *et al.* 1998, p. 63). Reasons for the decrease in number of wintering birds between the two periods are not known; however, migrational shifts could have contributed to the decrease in winter counts between survey periods (Collazo *et al.* 1998, p. 63). The number of nests observed at the selected study sites did not show such an appreciable decline during the same period for Puerto Rico and the nearby U.S. Virgin Islands, with nest counts ranging from 167 to 250 during 1980 to 1982, compared with 222 and 256 during 1992 to 1993 (Collazo *et al.* 1998, p. 64). Collazo *et al.* (2000, p. 42) estimated approximately 120–200 nesting pairs in Puerto Rico and 300–350 nesting pairs in the U.S. Virgin Islands. Information provided by Puerto Rico's Department of Natural and Environmental Resources places population estimates in the same relative range as Collazo *et al.* (1998) with an average of 437 individuals found in aerial surveys conducted from 1996 to 2004 (Department of Natural and Environmental Resources 2008, pp. 1, 3), although it is not known if these were summer or winter surveys. Additionally, the U.S. Virgin Islands' Department of Planning and Natural Resources reports that about 300 nesting pairs have been counted in the U.S. Virgin Islands annually (Department of Planning and Natural Resources 2008, p. 1), a comparable number to that reported by Collazo *et al.* (1998). Finally, more recent information from Bradley and Norton (2009, p. 275) reports 265 breeding pairs in Puerto Rico and 325 breeding pairs in the U.S. Virgin Islands.

Cuba.—Acosta-Cruz and Mugica-Valdés (2006, pp. 10, 65) reported that brown pelicans are a common resident species, with the population augmented by migrants during the winter. Brown pelicans have been documented nesting at five sites in the Archipiélago Sabana-Camagüey and in the Refugio de Fauna Río Máximo (Acosta-Cruz and Mugica-Valdés 2006, pp. 32–33). The number of nesting pairs at Refugio de Fauna Río Máximo was estimated at 16 to 36 pairs during monitoring in 2001 and 2002 (Acosta-Cruz and Mugica-Valdés 2006, p. 33). No estimates were given for other nesting sites. More recent data from Bradley and Norton (2009, p. 275) estimates there to be 300 nesting pairs in 18 colonies in Cuba.

Aruba.—Information provided by Veterinary Service of Aruba, the country's Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES; 27 U.S.T. 1087) Management Authority, estimates the breeding population on the island to be 20 pairs with a total population estimate of 60 individuals (Veterinary Service of Aruba 2008, p. 1).

Summary of West Indies.—Although we do not have detailed information on brown pelicans throughout all of the islands of the West Indies, the distribution and abundance of current breeding colonies reported by Collazo *et al.* (2000, p. 42), van Halewyn and Norton (1984, pp. 174–175, 201), and Bradley and Norton (2009, p. 275) are all similar and in the range of 1,500 to 2,000 breeding pairs.

Caribbean and Atlantic Coasts of Mexico, Central America, and South America

No comprehensive population estimates for the Caribbean and Atlantic Coasts of Central and South America are available to our knowledge, although some estimates for other portions of the species' range include birds that nest on the mainland coast or offshore islands (e.g., van Halewyn and Norton's estimate of 6,200 pairs in the Caribbean included birds nesting on the mainland and offshore islands of Colombia and Venezuela (1984, p. 201)).

Mexico.—Isla Contoy Reserva Especial de la Biosfera off the coast of Cancun, Quintana Roo, Mexico, was the site of Mexico's largest brown pelican nesting colony in 1986, with 300 nesting pairs (Blankenship 1987, p. 2). By the spring of 1996, 700 to 1,000 pairs of brown pelicans were estimated to be nesting on Isla Contoy (Shields 2002, p. 35). Four other colonies in this region accounted for 128 nesting pairs in 1986 (Blankenship 1987, p. 2).

Belize.—Miller and Miller (2006, pp. 7, 64) analyzed Christmas Bird Count data collected in Belize from 1969–2005 and reported that brown pelican numbers over this period have remained about the same. References compiled and summarized by Miller and Miller (2006, pp. 144–149) variously report brown pelicans as: ''Common: high density, likely to be seen many places,'' ''Transient, present briefly as migrant,'' ''Resident, species present all year,'' and ''apparently secure in Belize.'' Brown pelicans are also reported in one reference as nesting on several cays (small, low islands composed largely of coral or sand), but no information on number of nesting birds or locations are given.

Guatemala.—Brown pelicans in Guatemala are considered to be a breeding resident (Eisermann 2006, p. 55), although locations of nesting sites and number of breeding pairs are not given. Eisermann (2006, p. 65) estimated the Caribbean slope population of brown pelicans in Guatemala to consist of approximately 376 birds.

Honduras.—Thorn *et al.* (2006, p. 29) report brown pelicans nesting on the Caribbean coast of Honduras and offshore islands. Brown pelicans are reported as a common resident in Honduras, with numbers estimated to range between 10,000 and 25,000 birds and a stable population trend (Thorn *et al.* 2006, p. 20).

Nicaragua.—Zolotoff-Pallais and Lezama (2006, p. 74) report that the number of brown pelicans within Nicaragua falls within the range 1001–5000 and is stable, although they do not indicate whether this estimate represents only breeding birds.

Costa Rica.—Brown pelicans are considered a resident species in Costa Rica, but are not reported nesting on the Caribbean coast of Costa Rica (Quesada 2006, pp. 9, 46).

Panama.—Brown pelicans primarily nest in the Gulf of Panama on the Pacific coast with no nesting reported on the Caribbean coast (Angehr 2005, pp. 15–16). However, brown pelicans do winter along the Caribbean coast of Panama. In 1993, 582 brown pelicans were counted in Panama (Shields 2002, p. 22) along the Caribbean coast, and Angehr (2005, p. 79) considers brown pelicans to be a ''fairly common migrant'' along the Caribbean coast.

Colombia.—Moreno and Buelvas (2005, p. 57) report that brown pelicans occur at four sites on the Caribbean coast of Colombia, with a good population of brown pelicans in the coastal wetlands of La Guajira. However, no estimate of numbers of breeding birds was given. Information provided by Colombia's Instituto de Investigaciones Marinas y Costeras (INVEMAR) report approximately 20 breeding pairs on the Caribbean coast of Colombia with additional migratory birds present (INVEMAR 2008).

Venezuela.—Based on aerial surveys of the Venezuelan coast, Guzman and Schreiber (1987, p. 278) estimated a population size of 17,000 brown pelicans in 25 colonies. Within those breeding colonies, 3,369 nests were counted (Guzman and Schreiber 1987, p. 278). More recently, Rodner (2006, p. 9) confirms that there are approximately 25 brown pelican colonies in Venezuela. Rodner (2006, p. 9) does not give an overall estimate of the brown pelican population in Venezuela but notes more than 1,700 nests have been documented in four of the largest breeding colonies, while another recent census of four sites resulted in counts of 2,097 pelicans.

South of Venezuela, brown pelicans are reported as a nonbreeding migrant in Guyana (Johnson 2006, p. 5), French Guiana (Delelis and Pracontal 2006, p. 57), Surinam (Haverschmidt 1949, p. 77; Ottema 2006, p. 3), and Brazil (De Luca *et al.* 2006, pp. 3, 40)

Summary of the Caribbean/Atlantic Coast.—In general, brown pelicans are broadly distributed on the Caribbean and Atlantic coasts of southern Mexico and Central and South America and are still present throughout their historic range with population numbers likely in the range of 30,000 to 50,000 birds, based on the numbers presented above.

California and Pacific Coast of Northern Mexico

The most recent population estimate of the brown pelican subspecies that ranges from California to Mexico along the Pacific Coast is approximately 70,680 nesting pairs, which equates to 141,360 breeding birds (Anderson *et al.* 2007, p. 8). They nest in four distinct geographic areas: (1) The Southern California Bight (SCB), which includes southern California and northern Baja California, Mexico; (2) southwest Baja California; (3) the Gulf of California, which includes coastlines of both Baja California and Sonora, Mexico; and (4) mainland Mexico further south along the Pacific coastline (including Sinaloa and Nayarit) (Service 1983, p. 8).

During the late 1960s and early 1970s, the SCB population declined to fewer than 1,000 pairs and reproductive success was nearly zero (Anderson *et al.* 1975, p. 807). In 2006, approximately 11,695 breeding pairs were documented at 10 locations in the SCB: 3 locations on Anacapa Island, 1 on Prince Island, and 1 on Santa Barbara Island in California; 3 on Los Coronados Islands, 1 on Islas Todos Santos, and 1 on Isla San Martín in Mexico within the SCB (Henny and Anderson 2007, p. 9; Gress 2007). In 2007, brown pelicans in California nested on west Anacapa Island and Santa Barbara Island but did not nest on Prince Island (Burkett *et al.* 2007, p. 8). The populations on Todos Santos and San Martín islands were previously extirpated in 1923 and 1974, respectively; however, these were recently found to be occupied (Gress *et al.* 2005, pp. 20–25). Todos Santos Island had about 65 nests in 2004, but there were no nests in 2005. This colony is currently considered to be ephemeral, occurring some years and then not others (Gress *et al.* 2005, p. 28). At San Martín Island, 35 pairs were reported in 1999, a small colony was noted in 2000, and 125–200 pairs were seen in 2002, 2003, and 2004 (Gress *et al.* 2005, pp. 20–25).

The southwest Baja California coastal population has about 3,100 breeding pairs, the Gulf of California population is estimated at 43,350 breeding pairs, and the mainland Mexico populations (including islands) is estimated to have 12,385 breeding pairs (Anderson *et al.* 2007, p. 8). The Gulf of California population remained essentially the same from 1970 to 1988 (Everett and Anderson 1991, p. 125). It is thought that populations in Mexico have been stable since the early 1970s (when long-term studies began) because of their lower exposure to organochlorine pesticides (e.g., DDT), although annual numbers at individual colonies fluctuate widely due to prey availability and human disturbance at colonies (Everett and Anderson 1991, p. 133).

Summary of California and Pacific Coast of Northern Mexico.—Henny and Anderson (2007, pp. 1, 8) concluded that their preliminary estimates of nesting pairs in 2006 suggest a large and healthy total breeding population for California and the Pacific coast of Mexico.

Pacific Coast of Central America and South America

As with the Caribbean and Atlantic coasts of Central and South America, there are no comprehensive population estimates for brown pelicans along this portion of their range.

Guatemala, El Salvador, Honduras, and Nicaragua.—Brown pelicans are considered a nonbreeding visitor on the Pacific slope of Guatemala (Eisermann 2006, p. 4) with an estimated abundance of 2,118 birds. About 800 brown pelicans are widely distributed along the Pacific Coast of El Salvador (Ibarra Portillo 2006, p. 2). However, Herrera *et al.* (2006, p. 44) reported brown pelicans to be a nonbreeding visitor in El Salvador with numbers falling within the range 1,001–10,000 and an increasing trend. Brown pelicans occur on the Pacific Coast of Honduras but are not reported to nest there (Thorn *et al.* 2006, p. 26, 29). Zolotoff-Pallais and Lezama (2006, p. 74) report that the number of brown pelicans within Nicaragua falls within the range 1,001–5,000, but do not indicate locations or breeding status.

Costa Rica.—The Costa Rican Ministry for Environment and Energy has reported that several breeding colonies exist on the Pacific Coast from the Nicaraguan border to the Gulf of Nicoya and include the islands of Bolanos and Guayabo (Service 2007a, p. 13). Shields (2002, p. 35) estimated as many as 850 pairs in Costa Rica. However, Quesada (2006, p. 37) estimated the brown pelican population in Costa Rica to fall within the range 10,000–25,000 birds with a stable population trend.

Panama.—Estimates of brown pelicans in Panama have varied greatly over the years. In 1981, Batista and Montgomery (1982, p. 70) estimated that 25,500 adults and chicks were known to occur on just the Pearl Island Archipelago in the Gulf of Panama. In 1982, Montgomery and Murcia (1982, p. 69) estimated 70,000 adults occurred at 7 colonies within the Gulf of Panama. By 1988, 6,031 brown pelicans were known from just the Gulf, while in 1998, only 3,017 brown pelicans were thought to occur along the entire Pacific Coast of Panama, including the Gulf (Shields 2002, p. 22). By 2005, 4,877 brown pelican nests were reported just in the Gulf of Panama and a total population was estimated to be about 15,000 individuals for the entire Pacific Coast of Panama, which includes 150 nests found at Coiba Island in 1976 (Angehr 2005, p. 6). Angehr (2005, p. 12) also reported that those individual colonies that had been studied experienced an overall increase of 70 percent in nest numbers from 1979 to 2005, and describes the brown pelican on the Pacific Coast of Panama as an ''abundant breeder.''

Colombia.—Moreno and Buelvas (2005, p. 57) list brown pelicans as occurring at three protected sites on the Pacific coast of Colombia: Malpelo Island, Gorgona Island, and Sanquianga. Naranjo *et al.* (2006b, p. 178) estimated 2,000–4,000 brown pelicans at Sanquianga on the mainland and 4,800–5,200 on Gorgona Island. Brown pelicans were considered to be one of the most abundant resident species in a 1996–1998 assessment of waterbird populations on the Pacific Coast of Colombia (Naranjo *et al.* 2006a, p. 181). Naranjo *et al.* (2006b, p. 179) concluded that preliminary results of their waterbird monitoring program on the Pacific coast of Colombia indicate that populations of Pelecaniformes (which include brown pelicans) in the three protected areas are stable. INVEMAR (2008) also report approximately 3,000 breeding pairs known from the Pacific coast of Colombia, which represents approximately 6,000 birds and is consistent with estimates by Naranjo *et al.* (2006b).

Ecuador.—On Ecuador's Galapagos Islands, Shields (2002, p. 35) cites reports of a few thousand pairs. Delaney and Scott (2002, p. 29) estimated the population on the Galapagos to be 5,000 birds. Santander *et al.* (2006, pp. 44, 49) reported that brown pelicans in the Galapagos number less than 10,000 and are considered common there, while populations on the mainland range from 25,000 to 100,000. The Ministerio del Ambiente of Ecuador has reported that nesting brown pelicans are widely distributed and fairly common along the mainland coast of that country (Rojas 2006).

Peru.—Shields (2002, p. 22) summarizes estimates of brown pelicans in Peru at 420,000 adults in 1981–1982, 110,000 in 1982–1983, 620,000 in 1985–1986, and 400,000 in 1996. Franke (2006, p. 10) reported that a 1997 survey of guano birds counted 140,000 brown pelicans with an increasing population trend reported; however, it is unclear from the report whether that number represents a total estimate of the brown pelican population in Peru or a subset of birds nesting on islands managed for guano production.

Chile.—The range of brown pelicans in Chile extends from the extreme northern city of Arica (Rodríguez 2006) to occasionally as far south as Isla Chiloé (Aves de Chile 2006, p. 1). The total population size for Chile is unknown (Shields 2002, p. 35). The breeding population on Isla Pájaro Niño in central Chile was 2,699 pairs in 1995–1996, 1,032 pairs in 1996–1997, and none during the 1997–1998 El Niño (a temporary oscillation of the ocean-atmosphere system) year (Simeone and Bernal 2000, p. 453).

Two sightings of brown pelicans in Argentina in 1993 and 1999 are considered ''hypothetical'' records because they are not documented by specimens, photographs, or other concrete evidence (Lichtschein 2006).

Summary of Pacific Coast of Central and South America.—Brown pelicans are abundant breeders along the Pacific coast of Central and South America with population numbers in the range of 65,000 to 200,000 birds, not including an estimated 400,000 birds in Peru.

Summary—Global Distribution and Population Estimates

As discussed above, currently listed brown pelican populations are widely distributed throughout the coast of the Gulf of Mexico from Mississippi to Texas and the coast of Mexico; along the Caribbean coast from Mexico south to Venezuela; along the Pacific Coast from British Columbia, Canada, south through Mexico into Central and South America; and in the West Indies. Population estimates for various States, regions, and countries reviewed above are not strictly comparable because they were not made using any standard protocol or methodology, and in many cases the process by which the estimates were developed is not described. For example, surveys conducted in different parts of the year may yield differing results due to migratory trends and breeding patterns. While in some cases these estimates may be reliable in describing local abundance and trends, because of their incomparability, they have limited value in estimating absolute size or trends in the global population.

During our 5-year status review of the brown pelican, we estimated the global listed brown pelican population based on the best available information at the time of the review, which included most but not all of the individual estimates given above. Although these estimates represented the best available information at the time of the review, because of the lack of standardization and major differences in determining population estimates, we used conservative assumptions in tabulating these data in order to make a conservative estimate of the global population size of the brown pelican (*see* Service 2007a, pp. 43–45 and 60–62). Specifically, where only numbers of nests are known, the total number of nests was simply doubled to obtain an estimate of total population size for an area. This method likely underestimates the population size because there are likely to be unpaired or immature nonbreeders in the population. Additionally, where a population estimate found in the literature was a range of numbers, the lower number was used in calculating the global estimate. Population size is merely one factor in determining whether a species is recovered, and this approach assures we are making our determination in a manner that is protective of the species.

This total, or global estimate, as given in our 5-year review, is for the listed brown pelican, which does not include the Atlantic coast of the United States, Florida, and Alabama. The total based on regional estimates is over 620,000 individuals, which includes an estimated 400,000 pelicans from Peru (Service 2007a, pp. 43–45 and 60–62). This is likely a conservative estimate given that estimates for some countries given above (for example, estimates for Colombia and Cuba) were not readily available at the time we conducted our 5-year review. Other recent estimates yield similar numbers. Kushlan *et al.'s* (2002, p. 64) estimate for the North American Waterbird Conservation Plan area, which includes Canada, the United States, Mexico, Central America, the Caribbean, and Caribbean islands of Venezuela, was 191,600–193,700 breeders. Delaney and Scott (2002, p. 29) applied a correction factor to Kushlan *et al.'s* estimate to account for immature birds and nonbreeders to estimate a population of 290,000 birds. Neither estimate includes birds on the Pacific Coast of South America. Delaney and Scott (2002, p. 29) additionally estimated the brown pelican population on the Galapagos to be about 5,000 birds, and the population on the Pacific Coast of South America (estimate is for the subspecies *Pelecanus occidentalis thagus,* found in Peru and Chile) to range from 100,000–1,000,000 birds. Shields' (2002, p. 21) population estimate of 202,600–209,000 brown pelicans also did not include the Peruvian subspecies. While each of these estimates covers slightly different areas, they are all in general agreement and indicate that the listed population of brown pelicans, excluding the Peruvian subspecies, totals 200,000 or more individuals, while the Peruvian subspecies numbers in the few hundred thousand.

Recovery Plan

Section 4(f) of the Act directs us to develop and implement recovery plans for listed species. While brown pelicans were listed throughout their range, recovery planning efforts for the brown pelican focused primarily on those portions of the species' range within the United States. We have published three recovery plans for the brown pelican: (1) Recovery Plan for the Eastern Brown Pelican (Service 1979); (2) the California Brown Pelican Recovery Plan (Service 1983); and (3) Recovery Plan for the Brown Pelican in Puerto Rico and the U.S. Virgin Islands (Service 1986).

Section 4(f) of the Act requires the Service to develop and implement recovery plans for the conservation and survival of threatened and endangered species, unless we find that such a plan will not promote the conservation of the species. The Act directs that, to the maximum extent practicable, we incorporate into each plan: (1) Site-specific management actions that may be necessary to achieve the plan's goals for conservation and survival of the species; (2) objective, measurable criteria, which when met would result in a determination, in accordance with the provisions of section 4 of the Act, that the species be removed from the list; and (3) estimates of the time required and cost to carry out the plan. However, revisions to the List (adding, removing, or reclassifying a species) must reflect determinations made in accordance with section 4(a)(1) and 4(b). Section 4(a)(1) requires that the Secretary determine whether a species is threatened or endangered (or not) because of one or more of five threat factors. Therefore, recovery criteria must indicate when a species is no longer threatened or endangered by any of the five factors. In other words, objective, measurable criteria, or recovery criteria, contained in recovery plans must indicate when an analysis of the five threat factors under 4(a)(1) would result in a determination that a species is no longer threatened or endangered. Section 4(b) requires the determination made under section 4(a)(1) as to whether a species is threatened or endangered because of one or more of the five factors be based on the best available science.

Thus, while recovery plans are intended to provide guidance to the Service, States, and other partners on methods of minimizing threats to listed species and on criteria that may be used to determine when recovery is achieved, they are not regulatory documents and cannot substitute for the determinations and promulgation of regulation required under section 4(a)(1). Determinations to remove a species from the list made under section 4(a)(1) must be based on the best scientific and commercial data available at the time of the determination, regardless of whether that information differs from the recovery plan.

In the course of implementing conservation actions for a species, new information is often gained that requires recovery efforts to be modified accordingly. There are many paths to accomplishing recovery of a species, and recovery may be achieved without all criteria being fully met For example, one or more criteria may have been exceeded while other criteria may not have been accomplished, yet the Service may judge that, overall, the threats have been minimized sufficiently, and the species is robust enough, to reclassify the species from endangered to threatened or perhaps delist the species. In other cases, recovery opportunities may have been recognized that were not known at the time the recovery plan was finalized. These opportunities may be used instead of methods identified in the recovery plan.

Likewise, information on the species may be learned that was not known at the time the recovery plan was finalized. The new information may change the extent that criteria need to be met for recognizing recovery of the species. Overall, recovery of species is a dynamic process requiring adaptive management, planning, implementing, and evaluating the degree of recovery of a species that may, or may not, fully follow the guidance provided in a recovery plan.

Thus, while the recovery plan provides important guidance on the direction and strategy for recovery, and indicates when a rulemaking process may be initiated, the determination to remove a species from the List is ultimately based on an analysis of whether a species is no longer threatened or endangered. The following discussion provides a brief review of recovery planning for the brown pelican, as well as an analysis of the recovery criteria and goals as they relate to evaluating the status of the species.

The Recovery Plan for the Eastern Brown Pelican, which includes the Atlantic and Gulf Coasts of the United States, does not identify recovery criteria because the causes of the species' decline were not well understood at the time the plan was prepared. The recovery team viewed the wide distribution of the species, rather than absolute numbers, as the species' major strength against extinction (Service 1979, p. iv). This recovery plan also addressed brown pelicans in Alabama, Florida, and the Atlantic Coast of the United States, but because these populations have already been delisted, we only discuss the plan's objectives for the portion of the range that remained listed in Louisiana and Texas.

The recovery plan states a general objective to reestablish brown pelicans on all historically used nesting sites in Louisiana and Texas (Service 1979, p. iii). The plan identified 9 sites in Louisiana and 11 sites in Texas. These included historic, current (at the time of the recovery plan), and restored islands. Since 2005, brown pelicans have nested at between 11 and 15 sites in Louisiana and at 12 sites in Texas (Hess and Linscombe 2006, pp. 1–4, 7–8; Service 2006, p. 2). These sites include some of the same sites identified in the recovery plan as well as previously unknown or newly colonized sites.

The number and location of nesting sites has varied from year to year along the Gulf Coast due in part to frequent tropical storms, but generally meet the recovery plan goals for number of nesting sites. The northern Gulf of Mexico coast is subject to frequent severe tropical storms and hurricanes, which can cause significant changes to brown pelican nesting habitat. Past storms have resulted in changes to or loss of historical nesting sites, but brown pelicans seem well adapted to responding to losses of breeding sites by moving to new locations (Hess and Durham 2002, p. 7; Wilkinson *et al.* 1994, p. 425; Williams and Martin 1968, p. 136), and the species has clearly shown its ability to rebound (Williams and Martin 1968, p. 130; Holm *et al.* 2003, p. 432; Hess and Linscombe 2006, pp. 5, 13) (*see* ''Storm effects, weather, and erosion impacts to habitat'' under Factor A for further discussion).

While nesting is not occurring on all historically identified sites in Texas and Louisiana, the number of currently used nesting sites meets or exceeds the numbers identified in the recovery plan and supports sustainable populations of brown pelicans. Because brown pelicans have demonstrated the ability to move to new breeding locations when a nesting island is no longer suitable, meeting the exact number and location of nesting sites in Texas and Louisiana identified in the recovery plan is not necessary to achieve recovery for the brown pelican. As discussed further below, we also have considered the population's wide distribution, numbers, and productivity as indicators that the threats have been reduced such that the population is recovered and sustainable.

The Recovery Plan for the Brown Pelican in Puerto Rico and the U.S. Virgin Islands has delisting criteria solely for the area covered by the plan. The criteria are to maintain a 5-year observed mean level of: (1) 2,300 individuals during winter, and (2) 350 breeding pairs at the peak of the breeding season. Both recovery criteria are solely based on demographic characteristics and do not provide an explicit reference point for determining whether threats have been reduced. The levels in the criteria were based on studies of brown pelicans from 1980 to 1983 (Collazo 1985). Subsequent winter counts from 1992 to 1995 in Puerto Rico were 74 percent lower than during 1980–1982 (593 individuals compared to 2,289). Although the 1992 to 1995 counts did not include the Virgin Islands, it appears likely that the first criterion had not been met as of 1995 (Collazo *et al.* 1998). However, reasons for lower counts are unknown. Collazo *et al.* (1998, pp. 63–64) concluded that habitat was not limiting and suggested that migrational shifts could have contributed to the decrease in numbers and that longer term monitoring of at least 6 to 8 years is needed to define an acceptable range of population parameters for brown pelicans in the Caribbean. Collazo *et al.* (1998, p. 64) also concluded that contaminants are not affecting brown pelican reproduction.

Thus, while the first criterion, based on 4 years of data, may not be sufficient to establish a realistic figure to reflect recovery, it also does not address whether threats to the species are still present. Also, because the criterion applies to only a small portion of the species' range, as well as only a portion of the species' range in the Caribbean, we do not consider it relevant for determining whether the brown pelican is recovered globally. Of the two recovery criteria, the second criterion is the more appropriate to the evaluation of the status of the species as it reflects population productivity. The number of pairs seemed to be holding steady between the early 1980s and the 1990s with estimates given by Collazo *et al.* (2000, p. 42) of 165 pairs for Puerto Rico and 305–345 pairs for the U.S. Virgin Islands. While this estimate is not a 5-year observed mean, the estimated number is consistent with the recovery criterion for number of breeding pairs. Moreover, data from the U.S. Virgin Islands (Department of Planning and Natural Resources 2008, p. 1) supports the Collazo *et al.* (2000, p. 42) numbers by estimating the brown pelican population there at about 300 breeding pairs.

The California Brown Pelican Recovery Plan only covers the California brown pelican subspecies (*P. o. californicus*), which includes the Pacific Coast of California and Mexico, including the Gulf of California. The primary objective of this recovery plan is to restore and maintain stable, self-sustaining populations throughout this portion of the species' range. To accomplish this objective, the recovery plan calls for: (1) Maintaining existing populations in Mexico; (2) assuring long-term protection of adequate food supplies and essential nesting, roosting, and offshore habitat throughout the subspecies' range; and (3) restoring population size and productivity to self-sustaining levels in the SCB at both the Anacapa and Los Coronados Island colonies. Existing populations appear to be stable in Mexico and throughout the subspecies range (Everett and Anderson 1991, p. 133; Henny and Anderson 2007, pp. 1, 8), food supplies are assured by the Coastal Pelagic Species Fishery Management Plan, and the majority of essential nesting and roosting habitat throughout the subspecies' range is protected (*see* ''Summary of Factors Affecting the Species'' below for further discussion). Therefore, criteria 1 and 2 of the recovery plan have been met.

For population and productivity objectives, the recovery plan included the following additional criterion: (a) When any 5-year mean productivity for the SCB population reaches at least 0.7 young per nesting attempt from a breeding population of at least 3,000 pairs, the subspecies should be considered for reclassification from endangered status to threatened status; and (b) When any 5-year mean productivity for the SCB population reaches at least 0.9 young per nesting attempt from a breeding population of at least 3,000 pairs, the subspecies should be considered for delisting. Consideration for reclassification to threatened would require a total production averaging at least 2,100 fledglings per year over any 5-year period. Consideration for delisting would require a total production averaging at least 2,700 fledglings per year over any 5-year period.

The criterion, including both productivity and population size, for downlisting to threatened has been met at least 10 times since 1985. The delisting population criterion of at least 3,000 breeding pairs has been exceeded every year since 1985, with the exception of 1990 and 1992, which saw only 2,825 and 1,752 pairs, respectively. In most years, the nesting population far exceeds the 3,000 pair delisting goal; it has exceeded 6,000 pairs for 10 of the last 15 years (Gress 2005). Additionally, the delisting criterion of at least 2,700 fledglings per year over any 5-year period has been met at least 11 times since 1985 (Gress 2005). However, although productivity has improved greatly since the time of listing, the productivity criterion for delisting has not been met and the SCB population consistently has low productivity, with a mean of 0.63 young fledged per nesting attempt from 1985 to 2005 (Gress and Harvey 2004, p. 20; Gress 2005).

Productivity is an important parameter used for evaluating population health; however, it is difficult to determine an objective and appropriate minimum value. The 0.9 young per nesting attempt given in the recovery plan was the best estimate based on a review of brown pelican reproductive parameters in Florida and the Gulf of California (Schreiber 1979, p. 1; Anderson and Gress 1983, p. 84), because pre-DDT productivity for the SCB population was unknown. Despite the fact that this goal has not been reached, reproduction has been sufficient to maintain a stable population for more than 20 years. Most colonies expanded during this interval, including the long-term colonization of Santa Barbara Island, which suggests that productivity has been sufficient to maintain a stable-to-increasing population. In conclusion, the first two recovery criteria for the California Brown Pelican Recovery Plan have been met. As discussed above, the population component of the third criterion has been far exceeded, while the productivity component has not been met. We have concluded, based on current population size and productivity, that the productivity component of the third criterion is no longer appropriate because current productivity is sufficient to maintain a viable population of brown pelicans. Please see responses to comments 6 and 8 below for additional discussion of the productivity criterion.

Recovery Planning Summary—The three recovery plans for the brown pelican discussed above have not been actively used in recent years to guide recovery of the brown pelican because they are either outdated, lack recovery criteria for the entire species, or in the case of the eastern brown pelican, lack recovery criteria altogether. No subsequent revisions have been made to any of these original recovery plans. No single recovery plan covers the entire range of the species in the United States, and the remainder of the range outside the United States, including Central America, South America, and most of the West Indies is not covered by a recovery plan. Additionally, the recovery criteria in these plans do not specifically address the five threat factors used for listing, reclassifying, or delisting a species as outlined in section 4(a)(1) of the Act. Consequently, the recovery plans do not provide an explicit reference point for determining the appropriate legal status of the brown pelican based either on alleviating the specific factors that resulted in its initial listing as an endangered species or on addressing new risk factors that may have emerged since listing. As noted above, recovery is a dynamic process and analyzing the degree of recovery requires an adaptive process that includes not only evaluating recovery goals and criteria but also new information that has become available. Thus, while some recovery criteria and many of the goals in the three brown pelican recovery plans have been met, our evaluation of the status of the brown pelican in this rule is based largely on the analysis of threats in our recently completed 5-year review (Service 2007a, pp. 1–66), available at *http://ecos.fws.gov/docs/five_year_review/doc1039.pdf,* and presented below.

Summary of Public and Peer Review Comments and Recommendations

In our February 20, 2008 proposed rule, we requested all interested parties submit information, data, and comments concerning multiple aspects of the status of the brown pelican. The comment period was open from February 20, 2008, through April 21, 2008.

In accordance with our policy on peer review, published on July 1, 1994 (59 FR 34270), we solicited opinions from eight expert scientists who are familiar with this species regarding pertinent scientific data and assumptions relating to supportive biological and ecological information for the proposed rule. Reviewers were asked to review the proposed rule and the supporting data, to point out any mistakes in our data or analysis, and to identify any relevant data that we might have overlooked. Four of the eight peer reviewers submitted comments. Three of those four were generally supportive of the proposal to remove the brown pelican from the Federal List of Threatened and Endangered Species while the fourth reviewer did not offer an opinion. Their comments are included in the summary below and/or incorporated directly into this final rule.

During the 60-day comment period, we received comments from 19 individuals, organizations, and government agencies. We have read and considered all comments received. We updated the rule where it was appropriate, and we responded to all substantive issues received, below.

Peer Review Comments

(1) Comment: The inclusion of brown pelicans on the List (Federal List of Threatened and Endangered Wildlife) has provided us with a means of protecting habitat that has also protected many other species that share the marine habitat with the brown pelican. With this delisting, we will lose protections afforded to all these other marine species.

Response: When making listing and delisting determinations, we are only to consider the best scientific and commercial information data in preparing the five-factor analysis. This analysis has us consider a variety of impacts to the species in question and the regulatory mechanisms that may mitigate those impacts, but does not allow us to consider impacts of listing and delisting on other species. However, brown pelicans will remain protected by the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703–711; 40 Stat. 755) and, as discussed below, numerous other mechanisms confer protections to the brown pelican and to other species and habitats that are not dependent on the protections afforded brown pelicans by the Endangered Species Act.

(2) Comment: Multiple commenters expressed concerns over our global population estimate, specifically noting that the number reached is vague and speculative because a complete and coordinated survey for the entire species has never been done. Reviewers requested use of additional information if possible and, if not possible, inclusion of a more thorough justification for relying on the old and widely varying data in our global population estimate.

Response: The Act directs that we use the best scientific and commercial data available in making our determinations. This rulemaking was initially prompted by a petition to delist the species (*see* the ''Previous Federal Actions'' section of our proposed rule (February 20, 2008; 73 FR 9408)). In order to fulfill our requirements to respond to the petition and complete the rulemaking process once begun, we are statutorily required to make a determination at this time based on the best scientific and commercial data currently available to us. We recognize that additional research and coordinated efforts would yield a more reliable and accurate global population estimate. We have used the best available scientific and commercial data in developing our global population estimate. However, we have not relied solely upon this estimate in making our determination that the brown pelican no longer warrants listing. This number is developed and presented in efforts to provide the reader a general estimate of the scale of the global population, allow comparisons with other available estimates, and provide a summary and conclusion of the various estimates provided. While the accuracy of the specific number cannot be determined due to differences in survey methodology and information quality, the relative scale of the number, in the hundreds of thousands, is useful in demonstrating the degree of recovery the species has acheived and the absence of significant threats to the species. We have expanded the discussion under the ''Summary—Global Population Estimate'' section to further explain our rationale in developing this estimate.

(3) Comment: The discussion of the significance of the Puerto Rico brown

pelicans makes it seem that the Service is saying these birds are not important.

Response: In evaluating the brown pelican and whether it continues to require regulatory protection under the Act, we have looked at the species from a range-wide perspective first. The species' population numbers have rebounded and threats have been removed or reduced to the point that protection under the Act is no longer needed range wide. Next, we assessed whether any population may be experiencing localized threats over a significant portion of the range of the pelican such that its loss would lead to the species as a whole being at a greater risk of extinction. As discussed in ''Significant Portion of the Range'' section below, we have determined that the Puerto Rico population does not warrant listing as a significant portion of the range of the species, although this analysis does not imply that any subspecies, population, or subpopulation of brown pelican is not important to the long-term conservation of the brown pelican. In addition, once the pelican is delisted, brown pelicans will remain protected by the Migratory Bird Treaty Act and numerous other mechanisms, as discussed below. We will continue working with the Puerto Rico Department of Natural Resources through the post-delisting monitoring process to monitor the status of the brown pelican in Puerto Rico.

(4) Comment: A complete study of the genetics of the entire species would seem to be strongly warranted in order to further elucidate unique, small breeding populations.

Response: We agree and encourage continued research on the brown pelican; however, we don't believe a full understanding of the genetics of each individual breeding population is required in order to make our delisting decision, especially in the face of decreased threats and increased conservation and management opportunities.

(5) Comment: While population numbers confirm that delisting is the correct action, threats to the brown pelican still remain. There needs to be monitoring of the brown pelican and the marine environment post-delisting.

Response: Under section 4(g)(1) of the Act, we are required to monitor all species that have been recovered and delisted for at least 5 years post-delisting. On September 30, 2009 (74 FR 50236), we announced the availability of a draft post-delisting monitoring plan for the brown pelican which we expect to finalize within a year. We do not anticipate any of the factors currently affecting the brown pelican to become a threat to the status of the species in the future; however, if at any time during the monitoring program, data indicate that the protective status under the Act should be reinstated, we can initiate listing procedures, including, if appropriate, emergency listing.

(6) Comment: A peer reviewer noted that the productivity criterion developed in the California Brown Pelican Recovery Plan was somewhat subjective and based on comparisons to brown pelican productivity elsewhere. Despite this problem, the peer reviewer notes that the overall conclusions reached in the proposed rule concerning these productivity criteria—that a significant recovery has occurred in the Southern California Bight—are reasonable and logical.

Response: While recovery planning and the recovery criteria often included in recovery plans provide useful tangible benchmarks for the planning of conservation, the Act requires us to base listing and delisting assessments on the status of the species and an analysis of the factors affecting the species. This process allows us to determine that a species has achieved recovery even if it has not met all of its recovery criteria. In this case, the significant recovery of the California populations of brown pelican in terms of population trends and total population numbers has been deemed indicative of recovery of the species, although the specific productivity goal has not been met. *Please see* the ''Recovery Plan'' section above for additional discussion.

(7) Comment: Multiple commenters requested the Service to consider various updates to the Act, the Act's implementing regulations, and the recovery planning process. A peer reviewer specifically indicated that the Act has become ''out-of-step'' with principles that have more recently emerged from the fields of wildlife management and conservation biology.

Response: While we appreciate input on the efficacy of our program, these comments are not relevant to this rulemaking for the brown pelican.

Public Comments

(8) Comment: Concerning the California brown pelican Recovery Plan, a mean productivity value of 0.63 seems low. Perhaps better clarification should be made regarding the productivity value of similar birds and how 0.63 compares.

Response: Comparisons of productivity between species can be very tenuous. A large number of factors affect differences in productivity between species and even populations of the same species, including relative size of the animals, quality of the habitat, access to resources, breeding strategy, and feeding type. Conceptually, in order to maintain a population at a stable level, a productivity value of 2.0 (2 successful fledglings per nest) would be needed in order to keep a population level steady, assuming all fledglings survive to breeding age and each pair only reproduces once. In other words, this scenario would result in one-to-one replacement of adults by the new generation. Brown pelicans breed multiple times throughout relatively long lifetimes, thus they have multiple chances to replace themselves, making numbers near and even below 1.0 acceptable. The key point in our assessment is that the California populations have expanded and stabilized despite a productivity number below the target set in our 1983 California Brown Pelican Recovery Plan (Service 1983).

(9) Comment: The rule should include a discussion of potential weather-related issues caused by global warming including hurricane frequency and potential impacts to food supply.

Response: The Intergovernmental Panel on Climate Change (IPCC) concluded that warming of the climate system is unequivocal (IPCC 2007a, p. 30). Numerous long-term changes have been observed including changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather including droughts, heavy precipitation, heat waves and the intensity of tropical cyclones (IPCC 2007b, p. 7). While continued change is certain, the magnitude and rate of change is unknown in many cases.

Tropical storms (including hurricanes) have become more intense over the period of record (U.S. Climate Change Science Program (CCSP) 2008, p. 5). Multiple studies and analyses have been done concerning how tropical storm activity may change in the future. Predicting change in frequency and intensity is quite complicated with some factors potentially negating or exacerbating each other (e.g., sea surface temperature versus vertical wind shear, a measure of the difference in wind speed and duration over a vertical distance). There is general agreement that, based on current information, the intensity of individual storms is likely to increase over time; however, the global frequency of tropical storms is believed to stay stable or even decrease (CCSP 2008, p. 112). Some authors show an increase in global frequency of tropical storms (CCSP 2008, p. 112), but the likely magnitude and rate of those predicted increases is not known. Aside from the global predictions, there is some information that suggests the frequency of intense tropical storms in the North Atlantic may increase due to atmospheric moisture and increased sea surface temperatures; other studies show decreased frequency due to effects of wind shear.

At this time, the best available information does not allow us to predict whether a decrease in brown pelican populations would result from or be correlated with a future increase in hurricane activity. If this information should change in the future, the post-delisting monitoring program will reflect these declines and the situation may be reassessed in the future.

The distribution and abundance of marine fish species is dependent on a variety of factors that may be influenced by climate change including nutrient availability, ocean currents, and water temperature. It has been shown that population levels of anchovies, a main food source of pelicans in some areas, decrease in portions of the Pacific Ocean in response to the warmer waters found in El Niño years. Thus, it is possible that increased ocean temperatures, which may result from climate change, could decrease food supplies for brown pelicans. However, other studies show that El Niño results in increased population levels of sardines, another brown pelican prey species (Chaves *et al.* 2003, p. 217). In fact, multiple authors have shown that when anchovy abundances are high, sardine abundances are low and vice versa (Tourre *et al.* 2007, p. 4).

Because the brown pelican is a generalist in terms of prey sources, it is able to adapt to available food sources. Additionally, global fish populations are likely to be affected by climate change in much more complex ways than by simple ocean temperature rise, particularly the potential for shifting ocean currents and locations of nutrient upwelling. The response of ocean currents to global climate change is not well understood at this time due to the complicating factors of natural climate variability that occurs on various spatio-temporal scales, including the quasi-biennial (2- to 3-year periods), the inter-annual (3- to 7-year periods), the quasi-decadal (8- to 13-year periods), and the inter-decadal (17- to 23-year periods) (Tourre *et al.* 2007, p. 1), thus the response of marine fish species and effects to brown pelicans is even less predictable. At this time, we are not able to predict a decrease in brown pelican population levels in response to food availability effects of global climate change.

(10) Comment: The rule should include an expanded discussion on avian flu and other avian diseases.

Response: Discussion of multiple diseases and potential effects to brown pelicans can be found in the ''Disease and Predation'' section below. We have updated this section to include a discussion of avian influenza, also known as bird flu.

(11) Comment: Multiple commenters indicated that a variety of issues (e.g., avian botulism, domoic acid poisoning, avian disease, oil spills, mortality from recreational fisheries, coastal development) could be threatening the species throughout some portion of the range or are a greater threat to the brown pelican than we have presented in our analysis without providing additional information, references, or insight to explain their rationale.

Response: We believe we have used the best available scientific and commercial data in developing our five-factor analysis. An important point to consider when evaluating the status of a wide-ranging species such as the brown pelican is the scope, or the geographic and temporal extent, of the threat affecting the species. Some threats adversely impact one or more individuals of a species, while a threat to the species would be considered a factor that results in a decline in one or more population parameters. There are a lot of factors that have effects to individuals and local populations; however, these factors are not leading to population level impacts and certainly not resulting in rangewide adverse impacts.

(12) Comment: The Puerto Rican, West Indies, eastern Caribbean, and Colombian populations of brown pelican should remain listed because threats still persist in these areas.

Response: We acknowledge that a variety of factors continue to impact brown pelicans in various portions of the range of the species; however, we did not find that these factors are endangering the species throughout all or a significant portion of the range of the species now or in the foreseeable future. Please see additional discussion in the ''Significant Portion of the Range'' section below.

(13) Comment: The brown pelican continues to be threatened by pesticides because pesticides not registered for use in the United States are readily available for use in areas outside the United States.

Response: It is true that the number and kinds of pesticides available and registered for use varies from country to country. However, we have no information indicating that pesticide use is adversely impacting the brown pelican throughout all or a significant portion of the range of the species. In order to find pesticide use to be a threat to the brown pelican we would have to have information available that shows that pesticides are actually being used and are being used in a manner that impacts the species. It would be speculative to assert that pesticide use is a threat to the brown pelican solely because pesticides are accessible in some areas. In addition, we have determined that pesticides known to have affected brown pelican populations in the past are no longer a threat to the species. Please see the ''Pesticides and Contaminants'' section below.

(14) Comment: Additional discussion concerning the monitoring and enforcement of the Stockholm Convention is needed.

Response: The Stockholm Convention on Persistent Organic Pollutants is an international treaty that aims to eliminate the use of persistent organic pollutants (e.g., DDT) globally. The Convention went into effect on May 17, 2004, and carries the force of international law. Monitoring of activities under the Convention is achieved through voluntary reporting of production, import, and export activities to the Conference of the Parties. Currently, the Parties to the Convention are drafting measures for non-compliance with the Convention. The key portion of the draft noncompliance measures includes suspension from rights of the Convention for parties found to be noncompliant. Of particular importance is suspension from support under Articles 13 and 14 of the Convention, which provide for technical and financial assistance to developing country Parties and Parties with economies in transition. Further, violation of international laws generally may result in economic sanctions or could be brought before the International Court of Justice. Finally, pursuant to becoming Parties to the Convention, many countries across the range of the brown pelican have adopted national measures to reduce or eliminate use of various persistent organic pollutants. These measures are enforceable through a variety of local and national laws. *Please see* the ''Pesticides and Contaminants'' section below for additional discussion.

Summary of Factors Affecting the Species

Section 4 of the Act and its implementing regulations (50 CFR part 424) set forth the procedures for listing species, reclassifying species, or removing species from listed status. We may determine a species to be an endangered or threatened species because of one or more of the five factors described in section 4(a)(1) of the Act, and we must consider these same five factors in delisting a species. We may delist a species according to 50 CFR 424.11(d) if the best available scientific and commercial data indicate that the species is neither endangered nor threatened for the following reasons: (1) The species is extinct; (2) The species has recovered and is no longer endangered or threatened (as is the case with the brown pelican); and/or (3) The original scientific data used at the time the species was classified were in error.

A recovered species is one that no longer meets the Act's definition of threatened or endangered. Determining whether a species is recovered requires consideration of the same five categories of threats specified in section 4(a)(1) of the Act. For species that are already listed as threatened or endangered, this analysis of threats is an evaluation of both the threats currently facing the species and the threats that are reasonably likely to affect the species in the foreseeable future after delisting or downlisting and the removal or reduction of the Act's protections.

A species is ''endangered'' for purposes of the Act if it is in danger of extinction throughout all or a ''significant portion of its range'' and is ''threatened'' if it is likely to become endangered within the foreseeable future throughout all or a ''significant portion of its range.'' The word ''range'' in the ''significant portion of its range'' (SPR) phrase refers to the range in which the species currently exists. The Act does not define the term ''foreseeable future.'' However, in a January 16, 2009, memorandum addressed to the Acting Director of the Service, the Office of the Solicitor, Department of the Interior, concluded, ''* * * as used in the [Act], Congress intended the term 'foreseeable future' to describe the extent to which the Secretary can reasonably rely on predictions about the future in making determinations about the future conservation status of the species (M–37021, January 16, 2009).''

In considering the foreseeable future as it relates to the status of the brown pelican, we considered the factors acting on the species and looked to see if reliable predictions about the status of the species in response to those factors could be drawn. We considered the historical data to identify any relevant existing trends that might allow for reliable prediction of the future (in the form of extrapolating the trends). We also considered whether we could reliably predict any future events that might affect the status of the species, recognizing that our ability to make reliable predictions into the future is limited by the variable quantity and quality of available data.

For the purposes of this analysis, we will evaluate whether the currently listed species, the brown pelican, should be considered threatened or endangered. Then we will consider whether there are any portions of the brown pelican's range in danger of extinction or likely to become endangered within the foreseeable future. The following analysis examines all five factors currently affecting, or that are likely to affect, the listed brown pelican populations within the foreseeable future.

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Nesting Habitat

Brown pelicans breed annually from spring to summer above 30 degrees north latitude, annually from winter to spring between 20 and 30 degrees north latitude, and irregularly throughout the year on 8.5- to 10-month cycles below 20 degrees north latitude (Shields 2002, p. 12). Brown pelicans usually breed on small, coastal islands free from mammalian predators. Brown pelicans use a wide variety of nesting substrates. Nests are built on the ground when vegetation is not available, but when built in trees, they are about 1.8 meters (m) to 12.2 m (6 to 40 feet (ft)) above the water's surface (McNease *et al.* 1992, p. 252; Jiménez 2004, pp. 12–17).

Along the Pacific Coast of California south to Baja California and in the Gulf of California, brown pelicans nest on dry, rocky substrates, typically on off-shore islands (Service 1983, pp. 5–6). Along the U.S. Gulf Coast, brown pelicans mainly nest on coastal islands on the ground or in herbaceous plants or low shrubs (Shields 2002, p. 13; Wilkenson *et al.* 1994, pp. 421–423), but will use mangrove trees (*Avicennia* spp.) if available (Lowery 1974, p. 127; Blus *et al.* 1979a, p. 130). In some areas of the Caribbean, along the Pacific Coast of Mexico, and the Galapagos Islands, mangroves (*Avicennia* spp., *Rhizophora* spp., *Laguncularia* spp.) are the most common nesting substrate, although other substrates are used as well (Collazo 1985, pp. 106–108; Guzman and Schreiber 1987, p. 276; Service 1983, p. 15; Shields 2002, p. 13). Various types of tropical forests, such as tropical thorn and humid forests, also provide nesting habitat for brown pelicans in southern Mexico, South and Central America, and the West Indies (Collazo 1985, pp. 106–108; Guzman and Schreiber 1987, p. 2). Peruvian brown pelicans (found in Peru and Chile) nest only on the ground (Shields 2002, p. 13).

Nesting habitat destruction from coastal development. Within the United States, the majority of brown pelican nesting sites are protected through land ownership by conservation organizations and local, State, and Federal agencies. We are not aware of any losses of brown pelican nesting habitat to coastal development within the United States. In countries outside of the United States, some coastal and mangrove habitat used by brown pelicans has been lost to recreational and other coastal developments (Collazo *et al.* 1998, pp. 63). Mainland nesting colonies in Sinaloa and Nayarit, Mexico, have been impacted by increasing mariculture (the cultivation of marine life) and agriculture through habitat degradation, disturbance, and some removal of mangrove habitat (Anderson *et al.* 2003, pp. 1097–1099; Anderson 2007), although the extent of impacts is unknown. Van Halewyn and Norton (1984, p. 215) cited cutting and loss of mangrove habitat as a threat for seabirds, including brown pelicans, in the Caribbean. Aside from these limited accounts, we are not aware of any significant losses of brown pelican nesting habitat from coastal development anywhere within its range.

Some destruction of current and potential brown pelican nesting habitat is likely to occur in the future. However, a large number of brown pelican nesting sites throughout the species' range are currently protected (*see* discussion below). In some cases, loss of mangrove habitat has been specifically cited. However, brown pelicans do not nest exclusively in mangroves. They utilize a variety of nesting substrates and readily colonize new nesting sites in response to changing habitat conditions. For example, Collazo *et al.* (1998, p. 63) documented the loss of one nesting site in Puerto Rico, but stated the belief that the pelicans relocated to a new nesting colony nearby (see also discussion of colonization of new sites under ''Storm effects, weather, and erosion impacts to habitat''). Destruction of nesting habitat is likely to affect brown pelicans on a local scale only where nesting colonies overlap with coastal or mariculture development. In cases where nesting habitat destruction results in the loss of a nesting site, it is likely to be limited to a single season of lost reproduction because birds will likely disperse to other colonies or establish a new colony in a new location. Because numerous brown pelican nesting sites are protected, brown pelicans may relocate to new nesting sites if any unprotected sites are destroyed, and any loss of nesting habitat is likely to result in only limited loss of reproduction that will not affect population levels, we do not believe that nesting habitat destruction from coastal development currently threatens brown pelicans, nor do we believe it will become a threat that endangers the brown pelican throughout all of its range in the foreseeable future.

Storm effects, weather, and erosion impacts to habitat. Many nesting islands along the U.S. Gulf Coast have been impacted by wave action, storm surge erosion, and a lack of sediment deposition (McNease and Perry 1998, p. 9), resulting in loss or degradation of nesting habitat. Since 1998, nesting habitat east of the Mississippi River in Louisiana has undergone continual degradation or loss from tropical storms and hurricanes, resulting in a reduced number of successfully reared brown pelican young in this area (Hess and Linscombe 2006, p. 4). In 2003 and 2004, brown pelican nesting and reproduction was distributed approximately equally between areas east and west of the Mississippi River. After tropical storms in 2004, nesting habitat east of the Mississippi River was reduced, resulting in a shift to 95 percent of nesting and reproduction to west of the Mississippi River. In 2005, hurricanes Katrina and Rita resulted in approximately 349 km^2 (217 mi^2) of coastal land loss (Barras 2006, p. 4). This figure represents total coastal land loss, including interior marshes. Although a figure for barrier island loss would be a more appropriate measure of impacts to brown pelicans, we are not aware of any recent, comprehensive analysis of barrier island loss. Previous estimates of loss did not include the benefits of numerous restoration projects discussed below. While Louisiana's brown pelican nesting islands east of the Mississippi River were reduced by over 70 percent and what remains is vulnerable to overwash from future storm tides, at the time, these islands supported only about 5 percent of the total Louisiana population of brown pelicans (Hess and Linscombe 2006, pp. 3, 6; Harris 2006). Louisiana brown pelican nesting islands west of the Mississippi River, which accounted for 95 percent of the 2005 brown pelican breeding population, were degraded, but still supported the four main nesting colonies (Hess and Linscombe 2006, p. 5) (*see* discussion of nesting in Louisiana under ''Distribution and Population Estimate'').

In some instances, brown pelicans have responded to losses of breeding sites by dispersing and using other areas (Hess and Durham 2002, p. 7). Hess and Linscombe (2001, p. 5) believe that a shift in nesting from the Baptiste Collette area to Breton Island in Louisiana was the result of high Mississippi River levels and associated muddy water, which limited sight feeding. Additionally, two new brown pelican nesting colonies were established between 2000 and 2005 on Baptiste Collette and Shallow Bayou (Hess and Linscombe 2006, p. 5). Wilkinson *et al.* (1994, p. 425) reported the loss of large brown pelican nesting colonies on Deveaux Bank in South Carolina following a hurricane and subsequent movement and use of new nesting locations on that island and on Bird Key Stono. Hess and Linscombe (2001, p. 4) believe that tropical storm and hurricane-induced habitat damage to the Chandeleur Islands contributed to the initial dispersal of pelicans to southwest Louisiana and the formation of a nesting colony on newly created habitat at the Baptiste Collette bar channel.

While pelicans generally exhibit nest site fidelity, they can also demonstrate flexibility and adaptability. In Texas and Louisiana they have established breeding colonies on islands artificially created or enhanced by material dredged by the U.S. Army Corps of Engineers (Corps) from nearby ship channels (Hess and Linscombe 2001, pp. 5–6; Hess and Linscombe 2006, p. 5). For example, Little Pelican Island and Alligator Point in Texas are maintained by the disposal of dredged material (Yeargan 2007). The Corps in Louisiana beneficially uses approximately 8.5 million m^3 (11.1 million yds^3) of dredged material each year in the surrounding environment (Corps 2004, p. xi). For example, dredged material was used to retard erosion and secure Queen Bess Island as brown pelican nesting habitat (McNease *et al.* 1994, p. 8). It was also used to restore and enhance brown pelican habitat on Raccoon Island in 1987 and Last Island in 1992 following Hurricane Andrew (McNease and Perry 1998, p. 10; Hess and Linscombe 2001, p. 5). Use of these islands by pelicans demonstrates both the utility of these artificially generated habitats and the pelican's ability to find and establish nesting colonies on them.

While storms in Louisiana and the U.S. Gulf Coast are expected to continue in perpetuity, there are numerous projects that are intended to protect the coast from this land loss. Coastal habitat protection and restoration have been and will continue to be priorities for Louisiana, since coastal land loss has much broader negative implications to the State economy, oil and gas production, navigation security, fisheries and flyways, and strategic petroleum reserves. The Coastal Wetlands Planning, Protection, and Restoration Act of 1990 (CWPPRA), which provides Federal grants to acquire, restore, and enhance wetlands of coastal States, is one of the first programs with Federal funds dedicated exclusively to the long-term restoration of coastal habitat (104 Stat. 4779). As of April 2006, 10 CWPPRA barrier island restoration projects in Louisiana have been implemented (costing over 75.8 million dollars), with another 9 currently under construction or awaiting construction. Several of these directly enhance or protect current brown pelican nesting habitat (for example, Raccoon Island), while the rest occur on islands that were historically used or could be used for nesting in the future (Louisiana Coastal Wetlands Conservation and Restoration Task Force 2006, p. 13).

Two other restoration plans being implemented in coastal Louisiana are the Louisiana Coastal Area Ecosystem Restoration Plan (LCA) and Louisiana's Comprehensive Master Plan for a Sustainable Coast (State Master Plan). The LCA, administered by the Corps of Engineers with State cost-share assistance, focuses on the protection of coastal wetlands, including barrier island restoration. The State Master Plan includes barrier island protection and restoration as a key component. In addition, Louisiana's Coastal Impact Assistance Program (CIAP) also provides funding for barrier island restoration. The State Master Plan serves as Louisiana's overarching document to guide hurricane protection and coastal restoration efforts in the State. While none of these plans are considered existing regulatory mechanisms for the purposes of this delisting rule and they are not designed specifically to benefit brown pelicans, they may provide opportunities for us to monitor and to minimize the threats to brown pelicans from habitat loss and degradation caused by storms in the Louisiana Gulf Coast region after the species is delisted. They also demonstrate the level of importance State and Federal agencies place on maintaining and protecting those areas.

In other portions of the species' range, storms and weather conditions may also remove or degrade vegetation used for nesting by brown pelicans. Hurricanes (category 3 or higher) such as Hugo and Georges have severely affected red (*Rhizophora mangle*) and black (*Avicennia germinans*) mangrove habitat in Puerto Rico. Other coastal trees such as *Bursera simaruba* and *Pisonia subcordata,* which are prime nesting trees for pelicans in the U.S. Virgin Islands, have also been completely defoliated or torn down by hurricanes (Saliva 1989). Mangroves and other coastal trees may either be uprooted, completely defoliated, or killed (through dislodging of submerged roots by strong wave action), and several breeding seasons may pass before those areas recover. Similar effects of hurricanes and storms on nesting vegetation would be expected in other areas where brown pelicans nest in trees (some areas in the Caribbean, portions of the Pacific coast of Mexico, and parts of Central and South America). Along the U.S. Gulf Coast, mangroves can be killed off by extreme cold weather (Blus *et al.* 1979a, p. 130; McNease *et al.* 1992, p. 225; McNease *et al.* 1994, p. 6). Coastal black mangroves, decimated by freezes since the 1980s, were historically the nesting shrub of choice for brown pelicans in Louisiana, but now clumps of vegetation, like dense stands of nonwoody plants or low woody shrubs, are used (McNease *et al.* 1992, p. 225; Shields *et al.* 2002, p. 23).

While localized losses and degradation of nesting habitat from hurricanes, storms, and erosion have been documented (Wilkinson *et al.* 1994, p. 425; Hess and Linscombe 2006, p. 4), brown pelicans have demonstrated that they are capable of recovering from such losses. For example, brown pelican nests producing young in Louisiana have generally increased from a low in 1993 of 5,186 to a high of 16,501 in 2004 (Hess and Linscombe 2006, pp. 5, 13). During this timeframe, numerous tropical storms and hurricanes have made landfall on the Louisiana coast (Hess and Linscombe 2006, pp. 9–11). As of May 2006, less than a year after Hurricanes Katrina and Rita, Hess and Linscombe (2007, p. 4) noted a total of 8,036 nests in 15 colonies. Additionally, brown pelicans have shown they are capable of dispersing from nesting sites. Examples of this dispersal are the natural expansion and population growth observed following the reintroduction program in Louisiana (McNease and Perry 1998, p. 1) and more recently with the establishment of a new nesting colony at Rabbit Island (Hess and Linscombe 2003, p. 5). It is reasonable to expect island erosion will continue; however, it is also reasonable to expect State and Federal agencies to continue active maintenance and restoration of barrier islands through programs such as the CWPPRA and the State Master Plan.

We lack data on the effects of storms and erosion elsewhere in the range of the brown pelican. However, outside of the Gulf of Mexico and Caribbean, storms generally are less frequent and less severe. It is evident from the information on pelican responses to storms in the Gulf of Mexico that they are capable of successfully adapting to the changes that storms bring. In addition, brown pelicans are broadly distributed along the Gulf of Mexico, nesting at 15 sites in Louisiana in 2006 (LDWF 2007, pp. 1, 3) and 12 sites in Texas in 2006 (Service 2006, p. 2). The species' broad distribution and multiple nesting colonies reduce the risk that any single storm would affect the entire Gulf coast population of brown pelicans. Therefore, we believe that habitat modification or destruction of brown pelican nesting habitat by storms or coastal erosion will not endanger the brown pelican throughout all of its range in the foreseeable future.

Nesting Habitat Protection

A number of factors may affect the quantity and quality of brown pelican nesting habitat from year to year. However, almost all the U.S. nesting sites are protected from manmade habitat destruction and human disturbance, and a significant number of nesting sites outside the United States are also protected. Protections include designations as wildlife refuges, biosphere reserves, and national parks, as well as land ownership and protection by conservation organizations and local, State, and Federal governments. Because these protections are designed not only to protect brown pelicans, but other resources as well, such as other species of colonial waterbirds, and wetland, coastal, and marine habitats, we do not expect these protections to change when the brown pelican is delisted.

Gulf of Mexico Coast. Many of the Texas islands used by brown pelicans are leased, managed, and monitored by local chapters of the National Audubon Society (Audubon) (Audubon 2007a, p. 1). In Texas, Audubon staff assess the conditions of brown pelican islands throughout the year (Yeargan 2007) and implement management actions to address issues such as erosion and fire ant control. Additionally, there are local ''Bird Wardens'' that patrol the islands regularly (Audubon 2007b, p. 1). The two largest brown pelican nesting colonies in Texas, both in Corpus Christi Bay, Texas (Sundown Island, owned by the Port of Corpus Christi, and Pelican Island, owned by the Texas General Land Office), are part of the Texas Audubon Society's Coastal Sanctuaries program (Yeargan 2007; Audubon 2007b, p. 1; Service 2007b, p. 2). Audubon also owns North Deer Island, which houses the most productive waterbird colony in Galveston Bay and is the largest natural island remaining in the bay (Audubon 2007c, p. 1). A third major nesting site, Little Pelican Island, Galveston Bay, is owned by the U.S. Army Corps of Engineers (Corps) (Yeargan 2007). Audubon, in cooperation with the Corps, Texas Parks and Wildlife Department, and the Service, has placed signs around Little Pelican Island advising the public to avoid landing on the island during the nesting season (Service 2007b, p. 3).

Also in Galveston Bay, Evia and Midbay islands, owned by the Port of Houston, are important brown pelican nesting islands, and Alligator Point in Chocolate Bayou, owned by the Texas General Land Office, also supports breeding brown pelicans (Yeargan 2007). Brown pelicans are counted annually as part of the Texas Colonial Waterbird Survey (Service 2006, p. 1; Erfling 2007). Signs advising the public to avoid landing were posted at each island listed above and later lost during Hurricane Ike in 2008; however, the signs are to be replaced after the hurricane debris is removed (Erfling 2009).

Louisiana's North Island and Breton Island, two pelican nesting islands within the Chandeleur Islands chain, are part of the Service's Breton National Wildlife Refuge system (GulfBase 2007, p. 1). Signs are posted at the edge of the water indicating that the site is closed to human intrusion during the nesting season. In addition, during the nesting season, law enforcement personnel patrol the islands during periods of high human presence, such as on weekends and holidays (Fuller 2007c). One of Louisiana's largest pelican nesting colonies, Raccoon Island, in addition to Wine Island, East Island, Trinity Island, and Whiskey Island, are part of the Isles Dernieres Barrier Islands Refuge owned and managed by the LDWF, which restricts public access (Fuller 2007d). Additionally, there are several other small, intermittently used nesting colony sites, such as Martin and Brush islands, that are privately owned. However, these sites are remote and are likely only subject to occasional offshore recreational and commercial fishing activity.

West Indies. The two nesting sites documented by Collier *et al.* (2003, p. 113) on St. Maarten are protected: Fort Amsterdam as a registered and protected historic site, and Pelikan Key as part of a marine park. In addition, both sites have been proposed as Important Bird Areas (Society for the Conservation and Study of Caribbean Birds 2006, pp. 11–12).

In Puerto Rico and the U.S. Virgin Islands, most breeding colonies of brown pelicans are located within Commonwealth or Federal protected areas. Cayo Conejo, on the south coast of Vieques Island, Puerto Rico, is one of the two most active and largest brown pelican nesting colonies in Puerto Rico (Saliva 2003). The U.S. Navy began using the eastern portion of Vieques Island for training exercises in the early years of World War II, and acquired the eastern and western portions of the island between 1941 and 1943 (Schreiber 1999, pp. 8, 13, 18–21). Since that time, it has been used in varying intensities for activities including amphibious landings, naval gunfire support, and air-to-ground training (Service 2001, p. 4). In May 2003, the Navy ceased operations on Vieques Island via the Floyd D. Spense Defense Authorization Act of 2001 and transferred these lands to the Service, which subsequently designated it as the Vieques Island National Wildlife Refuge.

In the U.S. Virgin Islands, brown pelican colonies are fairly inaccessible on high cliffs or steep cays (Collazo 1985, pp. 106–108; Saliva 1996b); therefore, it is unlikely that human intrusion would be a major factor affecting pelican reproduction in those colonies.

The six nesting sites in Cuba identified by Acosta-Cruz and Mugica-Valdés (2006, pp. 32–33) are within areas identified as wetlands of international importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat. The convention itself does not provide specific protections of identified wetlands, but does commit the parties to the convention to formulate and implement planning for the conservation and management of wetlands within their countries. One of the brown pelican sites in Cuba, Refugio de Fauna Río Máximo, is additionally protected as a wildlife refuge (Acosta-Cruz and Mugica-Valdés 2006, pp. 32–33).

California and Pacific Coast of Mexico. Pelican nesting colonies in California occur within Channel Islands National Park and are protected from human disturbance and coastal development. West Anacapa Island, where approximately 75 percent of the SCB population nests (Gress *et al.* 2003, p. 15), is designated as a research natural area by Channel Islands National Park and closed to the public (NPS 2004, p. 4). To protect pelican nesting areas, Santa Barbara Island trails are seasonally closed (NPS 2006, p. 1), and Scorpion Rock off Santa Cruz Island is permanently closed to the public (NPS 2004, p. 2). In 1980, the waters adjacent to the Channel Islands were designated as a National Marine Sanctuary (15 CFR 922). This designation implements restrictions which include, but are not limited to, (1) no tankers and other bulk carriers and barges, or any vessel engaged in the servicing of offshore installations within 1.8 kilometers (km) (1.15 miles (mi)); (2) no motorized aircraft at altitudes less than 305 m (1,000 ft) over the waters within 1.8 km (1.15 mi); and (3) no exploring for, developing, or producing oil and gas unless authorized prior to 1981 (NOAA 2006, Appendix C).

Additionally, in 2003, the California Department of Fish and Game (CDFG) designated the waters adjacent to nesting brown pelican habitat on West Anacapa island as a Marine Reserve, increasing protections for that colony by prohibiting fishing and other boating activities at depths of less than 37 m (120 ft) from January 1 to October 31 of each year (California Code of Regulations, Title 14, Sections 27.82, 630, and 6321). In 1999, commercial squid fishing boats operating offshore of West Anacapa and Santa Barbara islands during the pelican breeding season, presumably because the (nonlocal) fishermen were not aware of the closure during the breeding season, used bright lights at night to attract squid to the surface (Gress 1999, p. 1). Use of lights at night was associated with brown pelican nest abandonment, chick mortality, and very low productivity (Gress 1999, pp. 1–2). Squid fishing has been observed around the Channel Islands in recent years, although it has not occurred near the colonies at a noticeable level since 1999 (Whitworth *et al.* 2005, p. 19). In 2004, the California Fish and Game Commission adopted the requirement of light shields and a limit of 30,000 watts per boat operating around the Channel Islands (CDFG Regulations, Section 149, Title 14, CCR). Although occasional disturbances may occur during the breeding season, such as illegal boating within the Marine Sanctuary, we believe the protections and active enforcement by the National Park Service (NPS) and CDFG have ensured that all nesting colonies in California remain relatively disturbance free.

As noted above, Mexico's nesting brown pelicans are monitored annually as an indicator species in the Gulf of California (Godinez *et al.* 2004, p. 48). All of the island nesting colonies and many of the mainland Mexico nesting colonies are protected from habitat destruction or modification by Mexican law because the sites are federally protected and designated as either Biosphere Reserve Areas for Protection of Flora and Fauna or National Parks (Anderson and Palacios 2005, p. 16; Carabias-Lilio *et al.* 2000, p. 3).

Central America, South America, and Caribbean Coast of Mexico. Isla Contoy Reserva Especial de la Biosfera off the coast of Cancun, Quintana Roo, Mexico, is Mexico's largest brown pelican nesting colony on the Caribbean coast. It is currently protected as a National Park within a Biosphere Reserve. Visitation is limited and strictly controlled to minimize impacts to the seabirds that nest and roost there.

Guatemala—Eisermann (2006, p. 63) identified 12 sites where brown pelicans are present within Guatemala, but did not indicate whether any of these are nesting sites. Of these 12 sites, 10 have some level of conservation as either Wildlife Refuges, National Parks, Areas of Multiple Use, or private protected areas (Eisermann 2006, p. 13).

Honduras—In Honduras, two of the four identified nesting sites for brown pelicans are currently protected: Monumento Natural Marino del Archipiélago de Cayos Cochinos and Laguna de Los Micos within Parque Nacional Blanca Jeannette Kawas (Thorn *et al.* 2006, pp. 8, 11, 29). A third nesting area, the cays of Isla Utila, has been proposed for protection as Refugio de Vida Silvestre Cayos de Utila and Reserva Marina Utila (Thorn *et al.* 2006, p. 9).

Nicaragua—Although Zolotoff-Pallais and Lezama (2006, p. 79) do not indicate any nesting sites for brown pelicans, they indicate that brown pelicans occur at four sites designated as wetlands of international importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat.

Costa Rica—In Costa Rica, the three major brown pelican nesting sites reported by Quesada (2006, p. 34), Isla Guayabo, Isla Negrita, and Isla Pararos, are protected as Biological Reserves. A fourth site, Isla Verde, identified as a roosting location for brown pelicans, is protected as a National Park (Quesada 2006, p. 34).

Panama—Angehr (2005, pp. 23, 26, 30, 34) identifies four nesting sites used by brown pelicans in Panama that are on lands with some official protective status: (1) Isla Barca Quebrada, within Coiba National Park; (2) Iguana Island, within Isla Iguana Wildlife Refuge; (3) a group of small islands mostly within the Taboga Wildlife Refuge; and (4) Pearl Islands, owned by the Panamanian environmental organization ANCON (National Association for the Conservation of Nature). There are many more nesting areas in Panama, but they lack protective status.

Colombia—In Colombia, the seven sites where brown pelican were documented to occur by Moreno and Buelvas (2005, pp. 11, 57) are included in a system of protected areas or as part of sanctuaries for wildlife and plants.

Venezuela—In Venezuela, Rodner (2006, p. 28) indicates that at least 9 of the 25 nesting colonies for brown pelicans are protected as either Parques Nacional, Monumentals Natural, or Refugios de Silvestre.

Ecuador—About 87 percent of the Galapagos Islands are a National Park (Exploring Ecuador 2006, p. 1), and commercial and tourist access to the Park is regulated by the government of Ecuador to protect natural resources (Service 2007a, p. 23). The resident human population on the Galapagos Islands has expanded in recent years, as has the number of tourists (Charles Darwin Foundation 2006, p. 13). The Charles Darwin Foundation, which works in the islands under an agreement with the government of Ecuador, has developed a strategic plan to address the management of increasing human presence in the islands (Charles Darwin Foundation 2006, p. 7). The plan's general objective is to ''forge a sustainable Galapagos society in which the people who inhabit the islands will act as agents of conservation.''

Peru—Proabonos, an agency in Peru's Ministry of Agriculture, protects and manages brown pelican nesting islands (Zavalaga *et al.* 2002, p. 9; Proabonos 2006). Additionally, Franke (2006, p. 8) indicates brown pelicans occur at four protected sites, although it is not clear whether these are nesting sites as well: Santuario Nacional Los Manglares de Tumbes, Zona Reservada Los Pantanos de Villa, National Reserve Paracas, and Santuario Nacional Lagunas de Mejía. Estimated increases in the brown pelican population along coastal Peru have been attributed to protective measures by the Government of Peru. The Ministry of Agriculture's Forest and Wild Fauna Management Authority (IRENA) lists the brown pelican as endangered, and provides prohibitions against take of the species without a permit (Taura 2006).

Chile—Simeone and Bernal (2000, p. 450) reported that Isla Pájaro Niño in Chile has been designated a Nature Reserve by the Chilean government for the protection of Humboldt penguins, brown pelicans, and other seabirds. The breakwater connecting the island to the mainland has controlled access, which has reduced human disturbance (Simeone and Bernal 2000, p. 455).

In summary, efforts to conserve nesting habitat are positively affecting nesting brown pelicans, resulting in an overall rangewide recovery. Although loss of nesting habitat has occurred on a local scale, for instance, in Puerto Rico (Collazo *et al.* 1998, p. 63) and Mexico (Anderson *et al.* 2003, p. 1099), we have no evidence that nesting habitat is limiting pelican populations on a regional or global scale. Threats from human disturbance of nesting colonies throughout most of the species' range have been abated through protection efforts, including federal and state ownership and management, designation of National Parks and Biosphere Reserves, signage to deter people from entering colonies, and restricted access. While nesting habitat at a local scale is lost to storms and erosion, particularly in the Gulf of Mexico (McNease and Perry 1998, p. 9), birds have been found to disperse to and colonize other natural areas (Hess and Durham 2002, p. 7) and manmade islands (Hess and Linscombe 2006, pp. 3, 6; Harris 2006).

Roosting Habitat

Disturbance-free roosting habitat is essential for brown pelicans throughout the year, for drying and maintaining plumage, resting, sleeping, and conserving energy (Jaques and Anderson 1987, pp. 4–5). Roosts also act as information centers for social facilitation. Essential characteristics of roost sites include: Proximity to food resources; physical barriers to minimize predation and disturbance; sufficient size for individuals to interact normally; and protection from adverse environmental conditions, such as wind and surf (Jaques and Anderson 1987, p. 5). Communal roosts occur on offshore rocks and islands; on beaches at mouths of estuaries; and on breakwaters, pilings, jetties, sandbars, and mangrove islets (Jaques and Anderson 1987, pp. 14, 19; Shields 2002, p. 7). Brown pelicans have two types of roosts, day and night roosts. Night roosts need to be larger and less accessible to predators and human disturbance than day roosts (Jaques and Anderson 1987, p. 27; Jaques and Strong 2003, p. 1). Along the Pacific Coast, brown pelicans use roost sites that are different from nest sites (Jaques and Anderson 1987, pp. 14, 19; Briggs *et al.* 1981, pp. 7–8). In other areas, brown pelicans generally use their nesting grounds as roosting grounds year round (Saliva 2003; Hess and Durham 2002, p. 1; Hess and Linscombe 2001, p. 1; King *et al.* 1985, p. 204). Because brown pelicans also use nesting sites as roosting sites and most of these nesting areas are already protected, as described above, we believe roosting habitat is also generally adequately protected. However, we have identified southern California as one area where roosting habitat may be limited. We discuss the adequacy of protections of southern California roosting habitat and its effects on the species below.

While not known to be a concern in other portions of the brown pelican's range, natural roost habitat is limited along the southern California coast due to a lack of rocky substrate, as well as coastal development and wetland filling (Jaques and Strong 2003, p. 1). Most roosts in southern California occur on jetties and breakwaters under jurisdiction of the Corps, although private structures such as barges and oil platforms also provide significant roost habitat (Strong and Jaques 2003, p. 20). Night roost habitat is further limited to large areas where disturbance is minimal, which may be causing pelicans to expend unnecessary energy to fly between daytime roosting/foraging areas along the mainland and distant night roosts in the Channel Islands (Jaques *et al.* 1996, p. 46; Jaques and Strong 2003, p. 12).

In California, all rocks, islands, pinnacles, and exposed reefs above mean high tide within 22.2 km (13.8 mi) of shore are included within the California Coastal National Monument, managed by the U.S. Bureau of Land Management (U.S. Bureau of Land Management 2005, pp. 1–3). Management includes monitoring and protecting geologic formations and the habitat they provide for seabirds and other wildlife (U.S. Bureau of Land Management 2005, pp. 1–3). Many pelican roost sites are on protected rocks and islands within the California Coastal National Monument.

The central California coast supports an important temporal component of pelican roosting habitat, supporting 69 to 75 percent of pelicans in California in the fall (Strong and Jaques 2003, p. 28). The Farallon Islands National Wildlife Refuge and Monterey Bay National Marine Sanctuary in central California protect and support roosting habitat (15 CFR 922; Thayer and Sydeman 2004, p. 2; Service 2007c, p. 1). CDFG designated the waters around the Farallon Islands as a State Marine Conservation Area, and the islands are part of the Gulf of the Farallons National Marine Sanctuary (CDFG 2007, p. 7; 15 CFR 922). The Marine Sanctuaries prohibit aircraft from flying below 305 m (1,000 ft) within their boundaries, and limit allowable uses to research, educational, and recreational activities. In general, commercial and recreational uses of marine resources are prohibited, but certain commercial and recreational harvests of marine resources may be permitted (CDFG 2007, pp. 4–5; 15 CFR 922).

Vandenberg Air Force Base (AFB), in southern California, consulted under section 7 of the Act with the Service regarding the effects of low-flying test flights, and agreed to avoid flying directly over roosting pelicans occurring on their mainland base (Service 2003a, p. 1). We have consulted with Vandenberg AFB multiple times regarding the impacts of missile launches on roosting pelicans and have determined that impacts are limited to a short-term startle effect (Service 1998, 1999, 2003a). A maximum of 30 missile launches per year at Vandenberg AFB are estimated (Vanderberg AFB 2008, p. 14). Therefore, potential impacts from missile launches are minimal because they are temporary in nature and will likely only occur a few times per month.

The Sonny Bono Salton Sea National Wildlife Refuge, inland from San Diego, is also used for roosting during the post-breeding season, and supports and protects up to 5,000 pelicans in the summer within its boundaries (Service 2007d, pp. 1–2). However, roosting habitat is expected to decrease after the year 2018 as a result of reductions of Colorado River water reaching the Salton Sea (Service 2002, p. 52), which could decrease the availability of forage fishes to pelicans and reduce the suitability of roosting habitat in this area (Service 2002, pp. 18, 51). The Bureau of Reclamation will compensate for this loss by creating new roosting habitat along the southern California coast (Service 2002, p. 52).

An atlas of pelican roost sites along portions of the central and northern California coasts was completed that will allow management agencies to evaluate the overall status of roosting habitat and help prioritize roost sites for protection. A similar atlas for the southern California coast was completed in January of 2009 (Service 2009a). In addition, the following restoration plans include projects that will benefit brown pelicans, regardless of the brown pelican listing status: American Trader Restoration Plan, Command Oil Spill Restoration Plan, Torch/Platform Irene Restoration Plan, Kure/Humboldt Bay Oil Spill Restoration Plan (KRP), Stuyvesant/Humboldt Coast Oil Spill Restoration Plan (SRP), and Montrose Settlement Restoration Plan (MSRP). The purpose of these plans is to restore natural resources, including seabirds, that were injured as a result of oil spills and hazardous substance releases along the California coast. One component of all these plans is to reduce human disturbance at roost sites in northern, central, and southern California through education, monitoring, and enforcement (American Trader Trustee Council 2001, p. 16; Command Oil Spill Trustee Council 2004, p. 60; Torch/Platform Irene Trustee Council 2006, p. 33; CDFG and Service 2008, p. 40; CDFG and Service 2007, p. 26; MSRP 2005, p. D6–1). The American Trader Trustee Council also funded a pilot program in 2004 to create new night roosting habitat in the form of a floating platform in the San Diego Bay National Wildlife Refuge salt ponds. While pelican use has been limited, the American Trader Trustee Council is exploring ways to enhance and improve the platform. The MSRP also includes roost site creation and/or enhancement as suitable restoration projects for the brown pelican (MSRP 2005, p. D6–1).

While some roosting habitat in the United States may still be susceptible to human disturbance, much of the brown pelican roosting habitat occurs within protected areas. There are ongoing efforts to identify and prioritize important roost sites, reduce disturbances at these sites, enhance existing roosts, and create new roost habitat. Southern California is the only area we are aware of with potentially limited roost sites. We have no information to indicate that roosting habitat may be limiting elsewhere in the species' range. Nevertheless, the limited number of existing roost sites has had no known impacts to the species and the population appears to be stable or increasing. Therefore, we do not believe that roost site disturbance will adversely affect the brown pelican throughout all of its range in the foreseeable future.

Prey Abundance

Brown pelicans feed on surface-schooling fish such as menhaden (*Brevoortia* spp.), mullet (*Mugil* spp.), sardines (*Sardinops sagax*), and anchovies (*Engraulis* spp.), which they catch by plunge-diving in coastal waters (Palmer 1962, p. 279; Blus *et al.* 1979b, p. 175; Gress *et al.* 1990, p. 2; Schreiber *et al.* 1975, p. 649; Schreiber 1980, p. 744; Kushlan and Frohring 1985, p. 92). The availability of high quality forage in the offshore area within 30 to 50 km (18 to 30 mi) of a colony during the breeding season is critical to pelicans for feeding young (Anderson *et al.* 1982, p. 28). Additionally, reproductive success is dependent on abundance and availability of prey within foraging distance of the colony (Anderson *et al.* 1982, pp. 23, 30; Everett and Anderson 1991, p. 133). Therefore, commercial harvests of pelican prey species have the potential to affect brown pelican population dynamics.

Commercial fishing. The Magnuson-Stevens Fishery Conservation and Management Act of 1976 (16 U.S.C. 1801 *et seq.*) requires management plans for commercial fish species to ensure optimum yield with guaranteed perpetuation of that resource and minimal impact to the ecosystem of which it is a part. Each coastal region of the United States is a member of one of eight Fishery Management Councils, each of which implements the local fishery management plan (16 U.S.C. 1801 *et seq.*).

The Pacific Fishery Management Council prepared the Anchovy Fishery Management Plan. Amendment 8 to the Anchovy Fishery Management Plan, adopted December 15, 1999 (64 FR 69888), changed the name of the Anchovy Fishery Management Plan to the Coastal Pelagic Species Fishery Management Plan (CPSFMP) and added Pacific sardine (*Sardinops sagax*), Pacific mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*), and market squid (*Loligo opalescens*) to the fishery management unit (CPSFMP 1998, p. 1–1). Amendment 8 divided these species into the categories of actively managed and monitored. Harvest guidelines for actively managed species, Pacific sardine and Pacific mackerel, are based on formulas applied to current biomass estimates and designed to ensure that adequate forage is available for seabirds, marine mammals, and other fish. There are no harvest guidelines for the monitored species (northern anchovy, jack mackerel, and market squid) because they are not currently intensively fished, although harvest and abundance data will be monitored (CPSFMP 1998, pp. 4–5). The northern anchovy fishery essentially ceased in 1983 due to a depressed market. The depressed market for northern anchovy is thought to be a long-term or possibly permanent condition, although this fishery continues today at a minimal level (CDFG 2001, pp. 303–305). A comprehensive assessment of the northern anchovy fishery will be conducted if the annual harvest approaches 25,000 metric tons (mt) (25,097 tons); however, the annual harvest as of 1999 was estimated to be only about 7,000 mt (6,889 tons) of an estimated biomass of 388,000 mt (381,872 tons) (Service 1999, pp. 1–2).

On June 10, 1999, the Service determined that Amendment 8 to the Anchovy Fishery Management Plan will not adversely affect brown pelicans in California because it would not decrease the availability of fish to pelicans (Service 1999, p. 1). The CPSFMP (1998, pp. 2–5) will continue to ensure that adequate forage is available to pelicans if economic conditions change and northern anchovies become more intensively fished. The CPSFMP will also ensure that other forage fishes used by pelicans, such as Pacific sardines and Pacific mackerel, are also managed to preserve adequate forage reserves (CPSFMP 1998, pp. 2–5). Implementation of the CPSFMP is not dependent on the brown pelican's status as an endangered species, and should not be affected by this delisting rule.

The central subpopulation of the northern anchovy extends south of the U.S. border along the west coast of Baja California, Mexico. However, there is no bilateral agreement between the United States and Mexico regarding the management of this subpopulation, and the Mexican fishery is managed independently and not restricted by a quota (CDFG 2001, p. 304). The Coronados Islands pelican population may have suffered reduced breeding success during the late 1970s as a result of intensive commercial anchovy harvests in Mexico (Anderson and Gress 1982, p. 130). Declines in the anchovy population in the early 1980s may have been caused by intensive harvesting in Mexico that far exceeded the California fishery (Service 1983, p. 57). Similar to the U.S. fishery, anchovy harvests in Mexico have decreased sharply over time, from an average 86,363 mt (85,000 tons) per year from 1962 to 1989, to an average of 3.65 mt (3.6 tons) from 1990 to 1999 (CDFG 2001, p. 303). However, if economic conditions change and anchovies become more intensively harvested in Mexico, availability of anchovies for pelicans could be reduced.

While no brown pelican prey species appear to be currently regulated by the Gulf of Mexico Fishery Management Council or the Caribbean Fishery Management Council (Web sites accessed*: http://www.gulfcouncil.org/,* and *http://www.caribbeanfmc.com/*) in the United States, regulations under authority of the Magnuson-Stevens Fishery Conservation and Management Act are sufficient to protect prey abundance for brown pelicans, including brown pelican food species currently being commercially fished and any that may be in the future. Therefore, we do not believe that commercial fishing will endanger the brown pelican or its prey throughout the United States, Mexico, and Caribbean portion of its range in the foreseeable future.

We do not have information from other countries on commercial fishery impacts to brown pelican prey abundance. However, we have no evidence to suggest that commercial fishing is limiting brown pelican populations. Populations of brown pelicans in Central and South America are generally large with stable or increasing trends, indicating that food resources are not limiting.

El Niño and Freeze Events. A mixture of subarctic and tropical waters, upwelling events, and varying depths of the Pacific Ocean result in seasonal, inter-annual (between year), and long-term variability in fish availability for brown pelicans (Dailey *et al.* 1993, pp. 11–13). El Niño events that occur periodically in the Pacific Ocean are characterized by warm, nutrient-poor water and reduced productivity (Dailey *et al.* 1993, p. 11; Leck 1973, p. 357; Duffy 1983b, p. 687), thus reducing brown pelican reproductive success and causing mortality in pelican chicks (Hayward 2000, p. 111). Pelicans have the flexibility to respond to changes in food supplies through variable reproductive rates, although a long-term decline in food abundance could have serious impacts on the pelican population (Anderson *et al.* 1982, p. 30). An incidental effect of El Niño is movement of brown pelicans into developed areas, presumably in search of food, exposing them to collision hazards with structures and vehicles (Leck 1973, p. 357). During the 1997 El Niño event, an increase was reported in the local pelican population from 200 to 4,000 birds within a few weeks within the city of Arica, Chile (CNN 1997, p. 1). El Niño events are generally limited to a single breeding season, and are not likely to result in long-term population declines (Dailey *et al.* 1993, p. 11).

McNease *et al.* (1994, p. 10) found that severe freezes limited feeding due to surface ice formation. Fish mortality related to freezes also negatively impacts the pelican's food supply on a short-term basis (McNease *et al.* 1994, p. 10). However, these events are typically localized and restricted to a single season in duration.

El Niños and severe freezes may impact brown pelicans on a short-term, localized basis, but they do not pose a rangewide threat to the continued existence of the species. The pelican is a long-lived species that has evolved with natural phenomena such as variation in food resources, winter storms, and hurricanes, such that sporadic breeding failures have little effect on long-term population stability (Shields 2002, p. 23). These factors are only significant when population sizes are small and reproduction is limited (as was the case in the late 1960s due to impaired breeding success caused by organo-chlorine residues). Because current population sizes and distribution are large and reproduction has been restored to a level that can compensate for normal environmental fluctuations, we do not believe these natural events threaten the species throughout all of its range in the foreseeable future.

Other Habitat Protections

U.S. laws that provide protections to brown pelican habitat are the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*), which requires equal consideration and coordination of wildlife conservation with other water resource developments, and the Estuary Protection Act (16 U.S.C. 1221 *et seq.*), which requires Federal agencies to assess impacts of commercial and industrial developments on estuaries. Section 10 of the Rivers and Harbors Act (33 U.S.C. 401 *et seq.*) regulates the building of any wharfs, piers, jetties, and other structures and the excavation or fill within navigable water. Sections 402 and 404 of the Federal Water Pollution Control Act (33 U.S.C. 1251 *et seq.*), as amended by the Clean Water Act (91 Stat. 1566) and the Water Quality Improvement Act (101 Stat. 7), provide for the development of comprehensive programs for water pollution control and efficient and coordinated action to minimize damage from oil discharges.

Additional environmental laws that help protect pelican habitat and food sources include: Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901 *et seq.*), which authorizes the purchase of wetlands from Land & Water Conservation Fund monies; North American Wetlands Conservation Act of 1989 (16 U.S.C. 4401 *et seq.*) which provides funding for wetland conservation programs in Canada, Mexico, and the United States; Anadromous Fish Conservation Act of 1965 (16 U.S.C. 757a *et seq.*), which provides funds for conservation, development, and enhancement of anadromous fish (marine fish that breed in fresh water) through cooperation with States and other non-Federal interests; Coastal Barrier Resources Act (16 U.S.C. 3501 *et seq.*), as amended by the Coastal Barrier Improvement Act of 1990, which encourages conservation of hurricane-prone, biologically rich coastal barrier islands by restricting Federal expenditures that encourage development of coastal barrier islands, such as providing National Flood Insurance; Coastal Zone Management Act of 1972 (16 U.S.C. 1451 *et seq.*), which provides fiscal incentives for the protection, restoration, or enhancement of existing coastal wetlands or creating new coastal wetlands and assessing the cumulative effects of coastal development on coastal wetlands and fishery resources; Shore Protection Act of 1988 (33 U.S.C. 2601 *et seq.*); Outer Continental Shelf Lands Act of 1954, as amended in 1978 and 1985 (43 U.S.C. 1301 *et seq.*); National Ocean Pollution Planning Act of 1978 (33 U.S.C. 1701 *et seq.*); Oil Pollution Act of 1990 (33 U.S.C. 2701 *et seq.*); Act to Prevent Pollution From Ships of 1980 (33 U.S.C. 1901 *et seq.*); Marine Pollution and Research and Control Act of 1989; Ocean Dumping Ban Act of 1988 (33 U.S.C. 1401 *et seq.*); Marine Protection, Research, and Sanctuaries Act of 1988 (Pub. L. 100–688); and Federal Insecticide, Fungicide, and Rodenticide Act of 1996 (7 U.S.C. 136 *et seq.*). These laws and regulations, taken collectively, help ensure the conservation of brown pelicans and their habitat.

Climate Change

The Intergovernmental Panel on Climate Change (IPCC) concluded that warming of the climate system is unequivocal (IPCC 2007a, p. 30). Numerous long-term changes have been observed including changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather including droughts, heavy precipitation, heat waves and the intensity of tropical cyclones (IPCC 2007b, p. 7). Species that are dependent on specialized habitat types, limited in distribution, or occurring already at the extreme periphery of their range will be most susceptible to the impacts of climate change. Such species would currently be found at high elevations, extreme northern/southern latitudes, or dependent on delicate ecological interactions, or sensitive to nonnative competitors. The brown pelican does not meet the profile of a species most susceptible to climate change. It is a wide-ranging species and is relatively general in its habitat selection as it is able to breed in a variety of coastal habitat types and feed on a variety of prey items. It is likely that the range of the species may shift and population centers may redistribute, but effects of climate change would not be expected to result in significant rangewide declines in the foreseeable future, based on information currently available.

In summary, conservation efforts are continuing to positively affect brown pelicans, resulting in an overall rangewide recovery. Although loss of nesting habitat has occurred on a local scale, for instance in Puerto Rico (Collazo *et al.* 1998, p. 63) and Mexico (Anderson *et al.* 2003, p. 1099), we have no evidence that nesting habitat loss is limiting pelican populations on a regional or global scale. While localized nesting habitat is lost to storms and erosion, particularly in the Gulf of Mexico (McNease and Perry 1998, p. 9), birds have been found to colonize in other natural areas (Hess and Durham 2002, p. 7) and on manmade islands (Hess and Linscombe 2006, pp. 3, 6; Harris 2006). The only area where we have determined roost sites to be limited is in southern California, but this has not had any known impacts to the population. Much of the U.S. brown pelican roosting habitat is within protected areas. We have no evidence to suggest that commercial fishing in the United States and elsewhere is limiting brown pelican populations by reducing the species' fish prey base and regulatory mechanisms are in place within the United States to manage fisheries to ensure adequate prey base for sea birds and other species. El Niños and severe freezes may impact brown pelicans on a short-term, localized basis, but these events do not pose a significant threat to the species. Although some local factors continue to affect brown pelicans, these factors are not of sufficient magnitude to affect any brown pelican populations. Therefore, we believe that the present or threatened destruction, modification, or curtailment of the brown pelican's habitat or range is not a significant factor affecting the brown pelican throughout all of its range, both now and for the foreseeable future.

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

We are not aware of any overutilization for commercial, recreational, scientific, or educational uses of brown pelicans, although within the United States, Canada, and Mexico, the brown pelican is protected from any such threats. In 1936, the Protection of Migratory Birds and Game Mammals Treaty was signed by the United States, Canada, Japan, Russia, and Mexico (50 Stat. 1311; TS 912), which adopted a system for the protection of certain migratory birds, including the brown pelican, in the United States and Mexico. This Treaty provides for protection from shooting and egg collection by establishment of closed seasons and refuge zones. Implementation of the treaty in the United States was accomplished by amending the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 *et seq.*). The MBTA and its implementing regulations (50 CFR parts 20 and 21) prohibit take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase, or barter, any migratory bird, their eggs, parts, and nests, except as authorized under a valid permit, and require that such use not adversely affect populations (50 CFR 21.11). The MBTA and its implementing regulations will adequately protect against overutilization of pelicans within the United States, Canada, and Mexico (*see* discussion of the MBTA in ''Effects of this Rule'' section below). Another Federal law that will continue to offer some form of protection for the brown pelican is the Lacey Act (16 U.S.C. 3371–3378), which helps the United States and other foreign countries enforce their wildlife conservation laws by prohibiting trade in wildlife, fish, and plants that have been illegally taken, possessed, transported, or sold in violation of other federal, state, and foreign laws protecting wildlife.

We do not have any information to indicate that overutilization for commercial, recreational, scientific, or educational uses is occurring now or will occur in the future. Therefore, we do not believe overutilization is a significant factor affecting the brown pelican throughout all of its range, both now and in the foreseeable future.

C. Disease or Predation

Several diseases have been identified as causing illness and mortality of brown pelicans. The diatom *Pseudo-nitzchia australis* (an algae) occasionally blooms in large numbers off the California coast and produces the toxin domoic acid that occasionally causes mortalities in pelicans (USGS 2002a, p. 5). Erysipelas, caused by the bacterium *Erysipelothrix rhusiopathiae,* caused mortality of about 350 pelicans off the coast of California during the winter of 1987–1988 (Shields 2002, p. 32). This outbreak was thought to have been caused by unusually warm waters combined with a large number of pelicans in that area. Avian botulism, caused by the bacterium *Clostridium botulinum,* has caused illness and mortality of pelicans at the Sonny Bono Salton Sea National Wildlife Refuge (USGS 2002b, p. 6). None of these disease outbreaks have had known long-term impacts on the population, and because occurrences are few and self-limiting, we do not believe impacts from these diseases will become a threat to brown pelicans throughout all of their range in the foreseeable future.

West Nile virus is listed on the Center for Disease Control's West Nile Virus Web page (*http://www.cdc.gov/westnile*) as causing the mortality of white pelicans (*Pelecanus erythrorhynchos*), the only other species of pelican native to North America. However, according to this same Web site and the USGS, no brown pelican deaths due to West Nile virus have been reported, although antibodies for the virus have been found in captive brown pelicans (USGS 2003a, p. 6). We do not believe impacts from West Nile virus will become a threat to brown pelicans throughout all of their range in the foreseeable future, since there is no evidence to date that it negatively impacts pelicans. The post-delisting monitoring plan will be designed to detect declines in brown pelican populations that might arise from a variety of threats, including West Nile virus. There is an extensive network of Federal and State wildlife agencies and other cooperators that monitor colonial nesting waterbird species, including the brown pelican (see ''Post-Delisting Monitoring Plan'' section below).

Similar to West Nile virus, avian influenza, also known as bird flu, is not currently impacting brown pelicans, but may be a threat in the future. The term avian influenza refers to multiple strains of the influenza virus carried by birds. Just as with the variety of strains of human influenza virus, the avian influenza viral strains differ in strength, transmission rates, and effects. Strains of avian influenza known as low pathanogenic avian influenza (LPAI) are commonly carried in the intestines of wild birds and generally do not result in sick or dead birds (CDC 2006, p. 1). However, if domesticated birds come into contact with a LPAI, the viral strain can mutate to a highly pathanogenic avian influenza (HPAI), which can result in significant illness and death (USGS 2006, p. 2). The mutated HPAI strain can be secondarily transmitted back to wild birds in addition to a variety of other species, including humans. Currently, the HPAI strain of avian influenza is not known to occur in the range of the brown pelican (USGS 2009). It is possible that the HPAI strain could be carried into the range of the brown pelican through human travel, importation of tainted materials, and migratory birds coming in from affected areas (USGS 2005, p. 2). At this time, avian influenza is not impacting brown pelicans and it is not known how populations would respond to exposure. Multiple government and international agencies are monitoring the progress of the disease (*see,* for example, USDA's BioSecurity for Birds at *http://www.aphis.usda.gov/animal_health/birdbiosecurity*). These avian influenza specific monitoring programs, in addition to our own post-delisting monitoring plan, are designed to detect declines in brown pelicans and other bird populations that might arise from threats such as avian influenza in the future.

Ticks have been implicated as the cause of nest abandonment on both a Texas and Peruvian island (King *et al.* 1977b, p. 1; Duffy 1983a, p. 112). However, these events were localized and apparently have had no long-term impact on population levels in these areas. Mites and liver flukes have also been reported in brown pelicans (50 FR 4942; February 4, 1985), but have not been noted to cause significant health impairment in healthy birds. We have no evidence that mites, liver flukes, or other parasites are limiting brown pelican populations now or are likely to in the future. Therefore, we do not believe impacts from parasites will become a threat to brown pelicans throughout all of their range in the foreseeable future.

Brown pelicans require nesting areas in close proximity to food supplies and free from mammalian predators and human disturbance (Anderson and Keith 1980, p. 65). There is no known significant impact from mammalian predation on brown pelicans, particularly since they generally nest at sites free of mammals that could depredate eggs or young. Mammalian predators introduced to seabird nesting islands, such as domestic cats (*Felis catus*) and rats (*Rattus* spp.), can have serious impacts on small and medium-sized seabirds, but they appear to have little impact on pelicans (Anderson *et al.* 1989, p. 102). However, in some areas we anticipate that the brown pelican will benefit from feral cat removal programs. The Montrose Trustee Council is planning to remove the feral cats from San Nicolas Island, a known brown pelican roosting location off the southern California coast, starting in 2009 (Service 2009b).

There are numerous reported avian predators of chicks and eggs: magnificent frigatebirds (*Fregata magnificens*), gulls (*Larus* spp.), red-tailed hawks (*Buteo jamaicensis),* peregrine falcons (*Falco peregrinus*), American kestrels (*Falco sparverius*), short-eared owls (*Asio flammeus*), cattle egrets (*Bulbulcus ibis*), night herons (*Nycticorax* spp.), American oystercatchers (*Haematopus palliatus*), crows (*Corvus* spp.), and mockingbirds (*Mimus gilvus*) (Schreiber 1979, p. 40; Saliva and Burger 1989, p. 695; Jiminez 2004, pp. 16–17). Avian predators occasionally destroy unguarded pelican nests, and disturbances to nesting colonies may flush pelicans from nests, increasing the risk of predation on eggs and young (Schreiber and Riseborough 1972, p. 126). However, if brown pelicans are undisturbed, at least one member of the breeding pair usually remains close to the nest to protect the eggs and vulnerable nestlings (Duffy 1983a, p. 113; Schreiber and Riseborough 1972, p. 126; Shields 2002, p. 12). In the absence of other human disturbances, egg and nest predation by mammals and other birds does not appear to impose a significant limitation on brown pelican reproduction. Most nesting islands are protected from human disturbance as discussed above. Therefore, we do not believe impacts from mammalian or avian predation will become a threat to brown pelicans throughout all of their range within the foreseeable future.

Disease and predation generally affect only small numbers of individuals. In addition, many disease events are usually limited in area and may only affect brown pelicans for a short period of time (e.g., for a single breeding season). Because brown pelicans are long lived, sporadic breeding failures that may be caused by parasites, disease, or predation, especially on a local scale, have little effect on long-term population stability (Shields 2002, p. 23). Because current populations and distribution are large and reproduction has been restored to a level that can compensate for normal environmental fluctuations, we do not believe that disease, parasites, and predation are a significant factor affecting brown pelicans throughout the species' range, both now and in the foreseeable future.

D. The Inadequacy of Existing Regulatory Mechanisms

As discussed in each of the factors, many regulatory mechanisms will remain in place after delisting that ensure future threats will be reduced or minimized. We believe these protections, taken together, provide adequate regulatory mechanisms to prevent the brown pelican from becoming endangered throughout all of its range in the foreseeable future.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Natural Factors

This discussion addresses direct mortality of brown pelicans. See Factor A for impacts to habitat from natural weather events such as storms and El Niño. Weather events and El Niño events may affect habitat and prey abundance as discussed above, but also may result directly in death or injury of individual brown pelicans. Boersma (1978, p. 1482) reported El Niño-season starvation of nestling brown pelicans in the Galapagos Islands. The 1982–83, 1986–87, and 1991–1994 El Niño events may have reduced the number of nesting brown pelicans in those years at Cayo Conejo, Puerto Rico (Schreiber 1999, p. 12). In extreme cases adult mortality has resulted from El Niño events (Shields 2002, p. 32), such as the especially severe El Niño (Southern Oscillation) of 1983 (Duffy 1986, p. 591). Mortality was not noted during the less severe event of 1978 (Boersma 1978, p. 1482). Shields (2002, p. 23, and reference cited within) states that food shortages as a result of El Niño and other climatic and oceanographic events may result in abandonment of nests and starvation of nestlings, but rarely results in adult mortality except in extreme events. Because brown pelicans are long lived, such sporadic and short-term breeding failures have little impact on long-term population viability.

Storms accompanied by severe tidal flooding can have a significant negative effect on brown pelican productivity (McNease *et al.* 1994, p. 10). While some adults may be killed during storm events, most impacts result in juvenile mortality and reduced fledgling production (Wilkinson *et al.* 1994, p. 425; Hess and Linscombe 2006, p. 4). Additionally, eggs and nestlings may be lost due to flooding (Hess and Linscombe 2006, p. 23) and nests built in trees are easily dislodged and destroyed during strong winds or major storms (Jiminez 2004, pp. 12–17; Saliva 1989). While McNease *et al.'s* (1994, p. 10) observations indicated a female that has produced eggs or nestlings will not nest again in the same season, Hess and Linscombe (2006, pp. 3, 7, 23) found pelicans rebuilding new nests on top of flooded and damaged nests.

In addition to freezes in Louisiana limiting brown pelican foraging and resulting in fish mortality, as discussed above under Factor A, McNease *et al.* (1994, p. 10) found effects from severe freezes included high initial brown pelican mortality from hypothermia, prolonged exposure to low temperatures, and death while plunge-diving into ice-covered water. However, severe freeze events in Louisiana are infrequent (McNease *et al.* 1994, p. 10) and have not precluded the Louisiana population from growing to large numbers since the restocking program began in the 1960s.

Winter storms and severe freezes may locally impact pelicans. For example, larger than usual numbers of pelicans began washing up on beaches in California during the winter of 2008–2009. This die-off of 300 to 400 birds appears to have occurred as a result of a winter storm event in the Pacific Northwest and weather-related stress in the northernmost portion of the winter range of the species where pelicans had remained late in the year due to relatively mild weather (California Department of Fish and Game 2009, pp. 7–8).

These natural factors may adversely affect brown pelicans on a short-term, localized basis, but do not pose a rangewide threat to the continued existence of the species. These factors generally affect only a limited number of individuals, affect only a localized area, or affect reproductive success for a single season. The pelican is a long-lived species that has evolved with natural phenomena such as variation in food resources, winter storms, and hurricanes. These factors are only significant when population sizes are small and reproduction is limited. Because current populations and distribution are large and reproduction has been restored to a level that can compensate for normal environmental fluctuations, we do not believe that natural events will endanger the species throughout all of its range in the foreseeable future.

Manmade Factors

Human disturbance of nesting pelicans. Adverse effects on nesting pelicans from human disturbance by recreationists, scientists, educational groups, and fishermen have been well documented (Anderson 1988, p. 342; Anderson and Keith 1980, pp. 68–69). Disturbance at nesting colonies, such as walking among or near nests, has been shown to adversely affect reproductive success of pelicans, and even result in abandonment of nests or entire colonies (Anderson and Keith 1980, p. 69).

Collier *et al.* (2003, pp. 112–113) offer human disturbance as the cause of a suspension of breeding activity in a brown pelican colony on St. Martin in the Lesser Antilles. The colony was near a resort with heavy boat and jet ski use. When a jet ski passed within about 400 m (1,312 ft) of a colony, 40 pelicans flushed, leaving their nests unattended and unprotected from predators, but none flushed when a slow-moving dive boat approached within 10 m (33 ft) of the colony.

In Puerto Rico and the U.S. Virgin Islands, most breeding colonies of brown pelicans are located within Commonwealth or Federal protected areas. The adverse effects of human disturbances by recreational vessels and fishermen have been suggested as potentially resulting in abandonment of pelican nests located at low elevations and close to the water (Jiménez 2004, pp. 12–17). Pelicans have been seen flushing from nests when boats approached within 152.4 m (500 ft), and have been noted to leave their nests unattended for as long as humans remained within this proximity (Saliva 1996a; Saliva 2003). Raffaele *et al.* (1998, pp. 224–225) summarized historical records of pelicans nesting in Puerto Rico and noted their extirpation from at least three colonies and suggests boat traffic as the cause. Schreiber (1999, p. 20) noted that one of these extirpated colonies may have moved to a nearby bay, hidden from boaters.

Along Mexico's Pacific Coast, human disturbance at colonies has resulted in nest abandonment, predation of eggs and chicks, and total abandonment or relocation of individual colonies (Anderson and Keith 1980, p. 69). Fishermen, birders, photographers, educational groups, and egg collectors (in past years) have occasionally disturbed the pelican colonies at critical times during the breeding season (Gress *et al.* 2005, p. 7). However, nesting brown pelicans are monitored annually as an indicator species in the Gulf of California (Godinez *et al.* 2004, p. 48), and although annual numbers fluctuate widely due to a number of factors, including disturbances at some colonies, the populations are considered stable (Everett and Anderson 1991, p. 133; Anderson and Palacios 2005, p. 2).

Although the threat of human disturbance has declined in Mexico as a result of conservation efforts and increased protection (Luckenbach Trustee Council 2006, p. 82), enforcement remains limited (Anderson *et al.* 2003, pp. 1103–1104) and many colonies are still susceptible to disturbances (Godinez 2006). However, effects from disturbance have not been substantial enough to result in documented population declines in the last 20 years (Anderson *et al.* 2004, p. 37). Therefore, while these local impacts are still occurring, we do not believe they currently threaten brown pelicans or will become a threat that endangers the brown pelican throughout all of its range in the foreseeable future.

Future conservation actions in Mexico that are not a factor in our rule to delist the brown pelican, but that would benefit brown pelicans and reduce human disturbance if implemented, are the restoration of seabird colonies on five pelican nesting islands along the Pacific Coast of Baja California as part of the Luckenbach Restoration Plan and the Montrose Settlements Restoration Program (MSRP) (Luckenbach Trustee Council 2006, pp. 74–82, 100, 106; MSRP 2005, pp. D5–11–12). Proposed restoration activities include reducing sources of disturbance at colonies by redesigning paths and walkways to manage human traffic, shielding light sources, and performing public outreach and education (Luckenbach Trustee Council 2006, pp. 20, 77).

While human disturbance can cause brown pelicans to flush from their nests, there are also situations where the birds have become habituated to nearby intense uses (for example, aircraft activity) without obvious effects on breeding efforts (Schreiber *et al.* 1981, p. 398). We believe the current protections provided by regulatory mechanisms other than the Endangered Species Act for nest sites in the United States and to prevent human disturbances to U.S. nesting colonies will adequately continue to protect brown pelicans throughout their range within the United States. Additionally, while human disturbance to brown pelican nesting colonies is still occurring outside of the United States, most of the countries in the species' range are protecting, and are expected to continue to protect, brown pelicans through implementation of restoration plans, designated biosphere reserves and parks, and land ownership and protection by conservation organizations and local, State, and Federal governments (*see* above for discussion of nesting habitat protections). These protections are implemented through various mechanisms that do not rely on the U.S. Endangered Species Act and therefore are expected to continue if the brown pelican is delisted. The current levels of human disturbance are not sufficient to cause population declines of brown pelicans, because brown pelicans may become habituated to some level of disturbance, may shift nesting locations (as indicated above in discussion of loss of nesting habitat), or may only experience a temporary loss of reproduction, such as for a single breeding season. While human disturbance of brown pelican colonies is continuing, we do not believe the level of disturbance is currently sufficient to result in population declines of brown pelicans throughout all of the species' range in the foreseeable future.

Pesticides and Contaminants. During initial recovery planning for brown pelicans, it was recognized that organochlorine pesticides were the major threat to the brown pelican in the United States and these pesticides acted by direct toxicity (affecting all age classes) and by impairing reproduction (reducing recruitment into the population) (Hickey and Anderson 1968, p. 272; Risebrough *et al.* 1971, pp. 8–9; Blus *et al.* 1979b, p. 183). Impairment of reproduction was attributed to a physiological response to the presence of high levels of the organochlorine dichlorodiphenyldichloroethylene (DDE) (Hickey and Anderson 1968, p. 272). DDE is the principal metabolite of DDT, a synthetic organochlorine compound that was widely used as a commercial and agricultural pesticide from the 1950s through the early 1970s (Risebrough 1986, p. 401; 37 FR 13369; July 7, 1972). Brown pelicans gradually accumulated these toxins by eating contaminated prey (Hickey and Anderson 1968, p. 271). DDE interferes with calcium deposition during eggshell formation, resulting in the production of thin-shelled eggs that are easily crushed during incubation (Gress 1995, p. 10). DDE also causes the death of embryos in the egg, and the death or aberrant behavior of recently hatched young (Blus 1982, p. 26). The primary reason for severe declines in the brown pelican population in the United States was DDT contamination in the 1960s and early 1970s.

In California, ocean sediments off the coast of Los Angeles were heavily contaminated with DDT residues from a DDT manufacturing facility that discharged waste into the sewage system, which entered the marine environment through a submarine outfall (Gress 1995, p. 10). This input ceased in 1970, after which DDT and DDE residues in the marine environment decreased sharply, and pelican reproductive success improved as eggshell thickness increased (Gress 1995, p. 10; Gress and Lewis 1988, p. 13). Reproductive declines are thought to occur when pelican eggshells average 15 to 20 percent thinner than normal (Gress 1994, p. 7). Mean eggshell thickness from 1986 to 1990 was only 4.6 percent thinner than the pre-1947 mean, a level which may contribute to lowered fledging rates in some birds, but is no longer causing population-wide reproductive impairment in brown pelicans (Gress 1995, p. 92).

DDE was also found to be detrimental to the reproductive success of brown pelicans in both Texas and Louisiana (King *et al.* 1977a, p. 423) and was the direct cause of brown pelican deaths in Louisiana (Holm *et al.* 2003, p. 431). Since banning of the use of DDT, levels of DDE residues have declined. The level of DDE residues in eggs collected in Texas from 1975 to 1981 was about one half the level found in eggs collected in 1970 (King *et al.* 1985, p. 205; King *et al.* 1977a, p. 423).

In 1997, Mexico introduced a plan to strictly curtail and then phase out use of DDT by 2007 (Environmental Health Perspectives 1997, p. 1). Mexico used DDT for control of malaria until 1999 (Salazar-García *et al.* 2004, p. 542), and then eliminated its use by 2000, several years ahead of schedule (Gonzalez 2005, p. 1). Recent contaminants studies in the Gulf of California, Mexico, indicate that this area remains one of the least contaminated with persistent organic pollutants in western North America (Anderson and Palacios 2005, p. 8).

Eggs were collected during the periods 1980 to 1982 and 1992 to 1993 in Puerto Rico and the U.S. Virgin Islands (Collazo *et al.* 1998, pp. 62–63). Concentrations of DDE and polychlorinated biphenyls (PCBs) were significantly higher in the Puerto Rico eggs than the U.S. Virgin Island eggs collected in the 1980s. However, Collazo *et al.* (1998, p. 64) state that brown pelican reproduction has not been affected by contaminants in Puerto Rico and the U.S. Virgin Islands at least since the 1980s. Additionally, contaminant concentrations in the eggs collected in the 1990s were significantly lower than those collected in the 1980s (USGS 2002b, p. 5).

The Environmental Protection Agency (EPA) banned the use of DDT in the United States in 1972 (37 FR 13369), and Canada's National Office of Pollution Prevention banned its use in 1985 (Canada Gazette 2005, p. 1). The Stockholm Convention on Persistent Organic Pollutants (*http://chm.pops.int/*) eliminated or reduced the use of 12 persistent organic pollutants, including DDT, in all participating countries in 2001. All countries within the breeding range of the brown pelican are participants. In addition to the United States and Canada, Cuba and Costa Rica have banned its use; Belize, Columbia, Mexico, and Venezuela have restricted its use; and eight countries limited access in other ways (*http://www.pesticideinfo.org*). Although low-level DDE contamination will probably persist for many years in areas where DDT was used, the impact to pelican populations is now believed to be negligible and is expected to continue to lessen over time. Because regulatory mechanisms are in place to ban or strictly limit use of DDT, and current levels of DDE contamination are no longer causing population-wide reproductive impairment in brown pelicans, DDT or DDE will not endanger the brown pelican throughout all of its range within the foreseeable future.

A number of other organochlorine pesticides have also been documented to have affected brown pelicans in some portions of their range. The organochlorine pesticide endrin is the probable cause of the brown pelican's rapid decline and subsequent disappearance in Louisiana (King *et al.* 1977a, p. 427). Endrin was first used in the Mississippi River Basin in 1952. In 1958, dead fish were reported near sugarcane fields where endrin was used, and die-offs of fish and other wildlife began to consistently occur when heavy rains produced runoffs from those fields (King *et al.* 1977a, p. 427). King *et al.* (1977a, p. 427) reported an estimated six million menhaden found dead between 1960 and 1963. Extensive fish kills persisted in the lower Mississippi River and other streams in sugarcane growing parishes of Louisiana through 1964 (King *et al.* 1977a, p. 427). It was concluded that endrin from both agricultural and industrial sources was responsible for the fish kills (King *et al.* 1977a, p. 427). Fish-eating ducks, such as mergansers, were also reported floating dead in streams and bayous (King *et al.* 1977a, p. 427).

According to Winn (1975, p. 127), the adverse impact of endrin on brown pelicans was demonstrated when more than 300 of the 465 birds introduced to Louisiana since 1968 died during April and May 1975. Brain tissue from five dead pelicans was analyzed. Chemists at Louisiana State University identified seven pesticides in the brain tissue, all chlorinated hydrocarbons widely used in agriculture. Most of the birds analyzed contained what experts regard as potentially lethal levels of endrin. In addition to endrin, residues of six other organochlorine pesticides (DDE, dieldrin, toxaphene, benzene hexachloride, hexachloro-benzene (HCB), and heptachlor epoxide) were found (Winn 1975, p. 127). This significant die-off demonstrated the vulnerability of brown pelicans to endrin and emphasized the possible role of pesticides in the brown pelican's decline in the eastern United States. Endrin is also one of the pesticides targeted for elimination by the Stockholm Convention on Persistent Organic Pollutants (*http://chm.pops.int/*). Although it is not currently banned in the United States, it is not registered for use in the United States or Canada and is banned in Belize, Colombia, Cuba, and Peru (*http://www.pesticideinfo.org*).

Dieldrin (another organochlorine pesticide) was also detected at levels considered detrimental to reproductive success for brown pelicans in the eastern portion of the United States (Blus *et al.* 1974, p. 186; Blus *et al.* 1975, p. 653; Blus *et al.* 1979a, p. 132). There is only slight evidence that dieldrin thins eggshells, whereas there is strong evidence indicating that it adversely affects egg hatching, post-hatching survival, and behavior of young birds (Dahlgren and Linder 1974, pp. 329–330; Blus 1982, p. 27). The agricultural use of dieldrin in the United States ceased in 1970 and it was discontinued as a termite control in 1987 (Centers for Disease Control and Prevention 2005, p. 340). From 1975 through 1978, dieldrin residues collected from brown pelican eggs in Texas were found at levels that do not pose a threat to reproductive success and survival (King *et al.* 1985, p. 206).

Other organochlorine insecticides, including chlordane-related compounds, HCB, and toxaphene, were rarely detected in brown pelican eggs collected in Texas from 1975 to 1978 (King *et al.* 1985, p. 206). PCBs are chemicals that were used as coolants and lubricants in transformers, capacitors, and other electrical equipment. Due to concern over the toxicity and persistence of PCBs, they were banned in the United States in 1978 (43 FR 33918) under authority of the Toxic Substance Control Act of 1976 (15 U.S.C. 2601 *et seq.*). Concentrations of PCBs in brown pelican eggs collected in Texas declined more than eight-fold between 1970 and 1981 (King *et al.* 1985, p. 206), and are now at levels not believed to be detrimental.

Claims have been made that organochlorine pesticides are still used in South and Central America (NatureServe 2007, p. 2). However, we are not aware of any reports of pesticides affecting reproduction outside of the United States. Nearly every nation within the range of the brown pelican has signed the 2001 Stockholm Convention on Persistent Organic Pollutants (Resource Futures International 2001, p. 11). Signatories to the Convention agree to eliminate the production and use of DDT, endrin, dieldrin, chlordane, HCB, toxaphene, and PCBs, as well as other persistent organic pollutants, with an exemption for use of DDT for disease vector (an organism that transmits disease, such as mosquitoes) control in accordance with World Health Organization recommendations and guidelines and when alternatives are not available. Parties exercising this exemption are to periodically report their use (Resource Futures International 2001, p. 12). These reports are listed on the Convention's Web site: *http://chm.pops.int/.* The evidence we have found indicates that reproduction in brown pelicans is no longer affected by the use of persistent organochlorine pesticides. Regulatory mechanisms are currently in place to eliminate or severely restrict their use such that they do not threaten the brown pelican throughout all of its range within the foreseeable future.

While effects from other environmental contaminants were not thoroughly known in the 1970s and 1980s, there were indications that some localized contaminant-related problems still existed for the brown pelican. National Wildlife Health Laboratory records of brown pelican mortality from 1976 to 1983 documented 10 die-off incidents totaling over 212 birds along the U.S. Atlantic Coast (Service 2007a, p. 29). More recently National Wildlife Health Laboratory records from July 1995 through June 2003 documented 13 incidents of brown pelican mortality for the continental United States east of the Rocky Mountains. None of these records cite problems with heavy metals, and pesticides were implicated in just one of these cases (USGS 2003b). Two pelicans from Florida had moderate brain acetlycholinesterase activity depression, an indicator of poisoning from either organophosphorus or carbamate pesticides. While these currently applied, short-lived, non-organochlorine pesticides may cause occasional mortality of individual pelicans, they do not accumulate within the body, nor do they persist in the environment; therefore, they are unlikely to result in widespread reproductive failure like that caused by the use of organochlorine pesticides.

In the United States, an important regulatory mechanism benefitting brown pelicans is the requirement that pesticides be registered with the EPA. Under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act, the EPA requires environmental testing of the effects of all new pesticides on representative wildlife species prior to EPA granting a pesticide registration. The EPA evaluates pesticides before they can be marketed and used in the United States to ensure that they will not pose unreasonable adverse effects to human health and the environment. Pesticides that meet this test are granted a license or ''registration,'' which permits their distribution, sales, and use according to requirements set by EPA to protect human health and the environment. The requirement for evaluation of pesticides during the registration process would not be altered if the pelican was delisted and protection of the Endangered Species Act were not available.

Efforts to ban and restrict use of persistent organic pollutants have reduced the contaminants that are most likely to cause widespread reproductive failures, and thus endangerment of the species. Other contaminants continue to be detected in some brown pelican populations, but these are generally short-lived pesticides or contaminants and effects have only been noted to occur on a local scale and affect few individuals and therefore are unlikely to have long-term effects on brown pelican reproduction or numbers. Regulatory mechanisms within the United States to evaluate and register pesticides, as well as the international convention restricting use of persistent organic pollutants, ensure that contaminant-caused mortality and widespread reproductive failures are unlikely to occur in the future. Therefore, we do not believe pesticides and contaminants are a significant factor affecting the brown pelican throughout all of its range, both now and for the foreseeable future.

Commercial fishing. Commercial fishing can have a direct effect on pelicans through physical injury caused by trawling gear. In 1998, a number of live and dead brown pelicans washed up on the beach at Matagorda Island, Texas (Sanchez 2007). Many had obvious wing damage. This incident coincided with the opening of the summer shrimp season. A similar incident in 1999 also coincided with the summer shrimp season (Sanchez 2007). It is possible that the young, inexperienced birds were colliding with the shrimp net lines while attempting to feed on the bycatch (unwanted marine creatures that are caught in the nets while fishing for another species), resulting in incidental death. Commercial fishing may adversely affect individual brown pelicans on a short-term, localized basis, but we do not believe it poses a rangewide threat to the continued existence of the species. Therefore, we do not believe this impact will become a significant factor affecting the brown pelican throughout all of its range in the foreseeable future.

Recreational fishing. Recreational fishing can have a direct effect on pelicans through physical injury caused by fishing tackle. Pelicans are occasionally hooked by people fishing from piers or boats (Service 1983, p. 62). Superficially embedded hooks can often be removed without damage; however, a small tear in the mouth pouch can hinder feeding and cause death from starvation (Service 1983, p. 63). Mortality is likely if a hook is swallowed or if there is substantial injury during hook removal (Service 1983, p. 63). Pelicans can become ensnared in monofilament fishing line which can result in serious injury, infections from cuts, impaired movement and flight, inability to feed, and death (Service 1983, p. 63).

Pelican Harbor Seabird Station, Inc., a Florida wildlife rehabilitator, reported that of the 200 pelicans handled in 1982, roughly 71 percent had fishing-related injuries. Of these, 12 (8.5 percent) died or were permanently crippled; the remainder were rehabilitated. Fishing-related injuries comprised about 35 percent of all observed mortality (February 4, 1985; 50 FR 4943). Another seabird rehabilitation group reported treating some 450 brown pelicans for fish line or hook injuries over a 4-year period (February 4, 1985; 50 FR 4943). However, this number of individuals affected is small in comparison to global population numbers and is therefore unlikely to affect long-term population stability.

Mortality from recreational fishing is thought to be insignificant to overall population dynamics, although it has been a significant cause of injury/mortality to newly fledged pelicans near colonies in California in the past (Service 1983, p. 62). Live anchovies used for bait and chumming (cut or ground bait dumped into the water to attract fish to the area where one is fishing) attract young pelicans, and they often swallow baited hooks that they encounter, which become embedded in bills or pouches (Service 1983, p. 63). In California, the closure to vessels at depths of less than 37 m (120 ft) offshore of West Anacapa Island has provided physical separation between fishing boats and the nesting colony, which has greatly reduced the likelihood of these interactions (Gress 2006). Several educational pamphlets have been developed and distributed by National Oceanic and Atmospheric Administration-Fisheries, in conjunction with the Service, NPS, and CDFG, to inform recreational fishermen in California about the impacts of hook and line injuries to pelicans and other seabirds and give step-by-step instructions for removing hooks and fishing lines from entangled birds.

While injuries and deaths from recreational fishing do occur, we believe they are accidental and localized, that they affect only few individuals, and are not likely to pose a significant factor affecting the brown pelican throughout all of its range, both now and in the foreseeable future.

Offshore oil and gas development. Oil spills and chronic oil pollution from oil tankers and other vessels, offshore oil platforms, and natural oil seeps continue to represent a potential source of injury and mortality to pelicans (Carter 2003, p. 3). The effects of oil on pelicans persist beyond immediate physiological injuries. Survival and future reproductive success of oiled pelicans that are rehabilitated and released are lower than for non-oiled pelicans (Anderson *et al.* 1996, p. 715). Injury and mortality of large numbers of pelicans would likely result if a significant oil spill occurred near a nesting colony during the breeding season or near traditional roost sites.

Oil spills from oil tankers and other vessels are far more common than spills from oil platforms (Carter 2003, p. 3). Since 1984, twelve major oil spill-related seabird mortality events occurred along the coast of California, all of which may have adversely affected breeding, roosting, or migrating pelicans (Hampton *et al.* 2003, p. 30). Only one of these events was from an offshore oil platform; the rest were from tankers, oil barges, or non-tanker vessels (Hampton *et al.* 2003, p. 30). As an example, on February 7, 1990, the oil tanker vessel American Trader ran aground at Huntington Beach, California, and spilled 1.6 million liters (416,598 gallons) of Alaskan crude oil (American Trader Trustee Council 2001, p. 1). An estimated 195 pelicans died as a result of the spill, and 725 to 1,000 oiled pelicans were observed roosting in the Long Beach Breakwater after the spill (American Trader Trustee Council 2001, p. 10). The spill occurred just before the start of the breeding season as the birds gathered at traditional roosts before moving to breeding islands, making large numbers of birds vulnerable to the oil (American Trader Trustee Council 2001, p. 10).

Along the United States coastline, National Marine Sanctuary regulations prohibit vessels, including oil tankers, from operating within 1.85 km (1.15 mi) of any of the Channel or Farallon islands or in the Monterey Bay or Olympic Coast sanctuaries (15 CFR 922). In the event of a major oil spill, this is probably an insufficient distance from the pelican nesting colonies to prevent impacts. Vessels frequently pass through the SCB in established shipping lanes that are within 5 km (3 mi) of Anacapa Island to the north and within 50 km (31 mi) to the south (Carter *et al.* 2000, p. 436). A traffic separation scheme north of Anacapa Island in the Santa Barbara Channel separates opposing flows of vessel traffic. The shipping lanes and traffic separation scheme in the SCB reduces the likelihood of spills because it reduces the probability of vessel-to-vessel and vessel-to platform collisions. Shipping traffic is increasing offshore of California, and this may result in increased oil spills and pollution events (McCrary *et al.* 2003, p. 48). There is also a shipping lane that passes within 25 km (16 mi) of Los Coronados Islands in Mexico (Carter *et al.* 2000, p. 436). However, because impacts of tanker spills are localized and occur infrequently, we expect that brown pelicans will be affected only within localized areas in the event of spills and that individual birds will only be affected infrequently. Therefore, we do not believe this impact is a significant factor affecting the brown pelican throughout all of its range, both now and in the foreseeable future.

There are 27 offshore oil platforms and 6 artificial oil and gas islands off the coast of southern and central California (McCrary *et al.* 2003, p. 43). There are no platforms within the Channel Islands National Marine Sanctuary (McCrary *et al.* 2003, p. 44), and oil and gas exploration and development are prohibited within this Sanctuary, excluding a few oil and gas leases that existed prior to its designation. Oil and gas exploration and development are prohibited in the other three National Marine Sanctuaries, Olympic Coast (Washington), Gulf of the Farallones (California), and Monterey Bay (California) (15 CFR 922), with the exception of a few leases that existed prior to each sanctuary's creation, although new petroleum operations are unlikely to occur on these leases (McCrary *et al.* 2003, p. 45). The sanctuaries essentially provide a minor buffer from oil platform accidents, allowing time for breakup of oil discharges, and time to respond before the oil reaches the shore. The last major spill from any of the oil platforms or associated pipelines was a well blowout in 1969 that released 80,000 barrels in the Santa Barbara Channel. The Minerals Management Service (MMS) estimates the risk of a spill of 1,000 barrels or more over the next 28 years at 41 percent (McCrary *et al.* 2003, p. 45). However, the likelihood that a spill would affect brown pelicans would depend on the location, timing, and local conditions associated with the spill. Past spills from oil platforms have not limited brown pelican recovery in California.

In the Gulf of Mexico, the Outer Continental Shelf (OCS) is categorized into planning areas. The Central Planning Area includes Louisiana and Mississippi, and the Western Planning Area includes Texas (Ji *et al.* 2002, p. 19). Based on sheer volume of oil transported to those facilities, coastal birds and their habitats in these areas are at greatest risk from spills originating in coastal waters. An MMS Oil Spill Risk Analysis (OSRA) predicted that in these Planning Areas large oil spills associated with OCS activities are low-probability events (Service 2003b, p. 7). The OSRA estimated only a 4 to 8 percent probability that an oil spill in the Gulf of Mexico greater than 1,000 barrels of oil would occur and contact brown pelican habitat in the Central Planning Area, and a similar spill scenario has only a 4 to 7 percent probability of reaching the Western Planning Area (Ji *et al.* 2002, pp. 56, 59). Estimates derived from the OSRA model are "conservative" in that they presume the persistence of the entire volume of spilled oil over the entire duration time and do not include cleanup activities or natural weathering of the spill (Ji *et al.* 2002, pp. 12–13).

Beginning in the 1980s, MMS established comprehensive pollution prevention requirements that include redundant safety systems, along with inspecting and testing requirements to confirm that those devices are working properly (Service 2003b, p. 7). There was an 89 percent decline in the volume of oil spilled per billion barrels produced from OCS operations between 1980 and the present, compared to the total volume spilled prior to 1980. Additionally, this spill reduction volume occurred during a period when OCS oil production has been increasing (Service 2003b, p. 7). Spills less than 1,000 barrels are not expected to persist as a slick on the water surface beyond a few days (Service 2003b, p. 8). Because spills in the OCS would occur at least 3 miles from shore, it is unlikely that any spills would make landfall prior to breaking up (Service 2003b, p. 8).

There are a number of regulatory mechanisms within the United States that address oil and gas operations. MMS is also responsible for inspection and monitoring of OCS oil and gas operations (McCrary *et al.* 2003, p. 46). All owners and operators of oil handling, storage, or transportation facilities located seaward of the coastline must submit an Oil Spill Response Plan to the MMS for approval (30 CFR 254). Several Federal and State laws were instituted in the 1970s to reduce oil pollution (Carter 2003, p. 2). In 1990, State and Federal oil pollution acts were passed, and agencies developed programs to gather data on seabird mortality from oil spills, improve seabird rehabilitation programs, and develop restoration projects for seabirds (Carter 2003, p. 2). There have also been improvements in oil spill response time, containment, and cleanup equipment (McCrary *et al.* 2003, p. 46). In the absence of swift and effective action by the responsible party for a spill, the U.S. Coast Guard will initiate action pursuant to the Oil Pollution Act of 1990 to control and clean up a spill offshore under regional area contingency plans, which have been developed for this scenario (40 CFR 300 Subpart B). These measures have not entirely eliminated the potential for oil spills, but have reduced the likelihood of spills, thereby reducing pelican deaths and alleviating the magnitude of the impacts on pelicans and other seabirds if a spill were to occur (Carter 2003, p. 3).

If an oil spill or other hazardous materials release does occur in the United States, the Natural Resource Damage Assessment (NRDA) process is in place to identify the extent of natural resource injuries (including injuries to wildlife), the best methods for restoring those resources, and the type and amount of restoration required. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 U.S.C. 9601 *et seq.*), the Oil Pollution Act of 1990 (33 U.S.C. 2701), and the Federal Water Pollution Control Act or Clean Water Act, as amended (33 U.S.C. 1251 *et seq.*) form the legal foundation for the NRDA Restoration Program and provide trustees with the legal authority to carry out Restoration Program responsibilities. Trustees for natural resources include the Departments of Agriculture, Commerce, Energy, and the Interior, and other agencies authorized to manage or protect natural resources (EPA 2007a, EPA 2007b, Department of the Interior 2007). Therefore, if an oil spill occurs and brown pelicans are negatively affected, injuries to brown pelican populations or their habitat may be restored through this process. For example, in California, negative effects to brown pelicans have been mitigated through the implementation of restoration measures in the American Trader Restoration Plan, the Command Oil Spill Restoration Plan, the Torch/Platform Irene Restoration Plan, and the Montrose Settlement Restoration Plan.

Oil spills from oilfields, pipelines, or ships have impacted brown pelicans in some other countries. For example, oiling related to an oilfield in Mexico (King *et al.* 1985, p. 208; Anderson *et al.* 1996, p. 211) and from a ship in the Galapagos Islands, Ecuador (Lougheed *et al.* 2002, p. 5) affected brown pelicans. Although 117 brown pelicans were reported as affected by the 2001 spill in the Galapagos Islands from the fuel tanker Jessica, no mortalities of pelicans were reported (Lougheed *et al.* 2002, p. 29). From these accounts, brown pelicans frequently survive these incidences, especially when receiving some rescue cleanup. Oil spills have been identified as a possibility in oil-producing areas of Venezuela, with concern for effects on marine productivity and the food supply of brown pelicans, as well as for direct oiling of birds (Service 2007a, p. 39). While spills outside of the United States are still a possibility, they would be localized and thus would not become a threat that would endanger the brown pelican throughout all of its range in the foreseeable future. In addition, there are a number of international conventions and their amendments, including the International Convention on Civil Liability for Oil Pollution Damage, International Convention on Oil Pollution Preparedness Response and Co-operation, International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, and the International Convention on the Establishment of an International Fund of Compensation for Oil Pollution Damage. The majority of countries within the range of brown pelicans are parties to one of more of these international agreements (*http://sedac.ciesin.org/entri/treatyMultStatus.jsp*), which would assist with prevention, as well as response and restoration activities in the event of oil spills outside the United States.

Other much less common effects of offshore oil and gas development have occasionally been documented. There have been several instances in Louisiana of unusual and infrequent mortalities, generally involving juvenile brown pelicans, associated with the design and construction of inshore and offshore oil platforms (Fuller 2007a, p. 1). Brown pelicans have been observed strangling in inshore rig railings and drowning in uncovered casements (large pipes used in the drilling process that may fill with water). The number of brown pelican mortalities in these incidences was low. However, through consultation with the Service, MMS, and the Louisiana Department of Natural Resources, those features were modified to virtually eliminate the problem (Fuller 2007a, p. 1). Because brown pelicans are also protected by the MBTA, these modifications to prevent mortalities are expected to remain in place after the protections of the Act are removed.

Oil spills and oil pollution continue to have potential impacts on brown pelicans, but spill prevention, response, and restoration activities have become more organized and effective, and the breeding range is large enough that a single spill, even a major one, would likely only affect a small fraction of the population. Additionally, the death of pelicans from design flaws on platforms is rare and being remedied. Therefore, we believe that oil and gas activities, while they may occasionally have short-term impacts to local populations, will not become threats that endanger the brown pelican throughout all of its range in the foreseeable future.

Miscellaneous. Within the United States, brown pelican mortalities have been documented from electrocution on power lines and drowning in water intake pipes. In both cases, through consultation with the Service, those features were modified to virtually eliminate the problem (Fuller 2007b, p. 1). These events were unusual instances of short-term, localized impacts to brown pelicans. Continued protection of brown pelicans under the MBTA will ensure that future brown pelican mortality caused by design of man-made features are similarly addressed.

Conclusion

As required by the Act, we considered the five threat factors in order to assess whether the brown pelican is threatened or endangered throughout all of its range. When considering the listing status of the species, the first step in the analysis is to determine whether the species is in danger of extinction throughout all of its range. If this is the case, then the species is listed as endangered in its entirety. For instance, if the threats on a species are acting only on a portion of its range, but the effects of the threats are such that they place the entire species in danger of extinction, we would list the entire species.

As discussed above, the primary reason for severe declines in the brown pelican population in the United States, and for designating the species as endangered, was likely DDT contamination in the 1960s and early 1970s. Additionally, pesticides like dieldrin and endrin were also found to negatively impact brown pelicans. Since the banning of these organochlorine pesticides, brown pelican abundance within the United States has shown a dramatic recovery, and although annual reproductive success varies widely, populations have remained generally stable for at least 20 years. The EPA requires registration and testing of new pesticides to assess potential impacts on wildlife, so we do not anticipate that a pesticide that would adversely affect brown pelicans will be permitted in the future. Although DDT contamination continues to persist in the environment, based on the nesting population size, overall population stability, and improved reproductive success, the continued existence of brown pelicans is no longer threatened by exposure to DDT or its metabolites, and populations within the United States have recovered adequately to warrant delisting. We have no evidence that brown pelicans outside the United States ever declined in response to persistent organic pesticides.

Nesting and roosting colonies in the United States are expected to continue to be protected from human disturbance through local conservation measures, laws, numerous restoration plans, and ownership of many of the nesting and roosting habitats by conservation groups and local, State, and Federal agencies. In most countries outside of the United States where brown pelicans occur, protection is expected to continue through implementation of restoration plans, designated biosphere reserves and parks, and land ownership by conservation organizations and local, State, and Federal governments.

Some nesting and roosting habitat is expected to continue to be limited at certain local scales, just as some habitat destruction is expected to continue. However, the majority of nesting sites within the United States and many outside the United States are protected. While some nesting habitat may be lost, it is not likely to be a limiting factor in brown pelican reproductive success, since pelicans are broadly distributed and have the ability to shift breeding sites in response to changing habitat and prey abundance conditions. In response to storms, erosion, and lack of sedimentation, brown pelicans have exhibited their dispersal capabilities; they have established new colonies elsewhere, and shown an ability to rebound from low numbers. Additionally, there are several restoration activities, such as artificial island creation and enhancement with dredge material and barrier island restoration and protection that will continue to enhance and protect brown pelican habitat, particularly within the U.S. Gulf Coast region.

Impacts from weather events, such as El Niños and severe freezes, are also expected to continue. Natural factors such as these may adversely affect pelican reproduction and survival on a short-term, localized basis, but alone pose only a minimal threat to the species at current population numbers.

Brown pelican prey abundance in the United States will continue to be monitored and managed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976. We do not have any information from outside of the United States on commercial fishery impacts to brown pelican prey abundance; however, based on population numbers, there is no reason to believe that commercial fisheries are currently limiting brown pelican reproductive success.

Brown pelicans are not threatened with overutilization for commercial, recreational, scientific, or educational purposes. Research on pelicans is generally observational and noninvasive. Although several diseases have been identified as a source of mortality for brown pelicans, they appear to be self-limiting and sporadic and are not likely to impact long-term population trends. Predation is a minor threat that occurs when disturbance to nesting colonies leaves eggs and chicks unprotected, making it essential that nesting colonies are protected from disturbance, as noted above.

Commercial and recreational fishing may adversely affect brown pelicans on a localized basis, but pose no rangewide threat to the continued existence of the species. Oil spills and oil pollution continue to be a potential threat, but the breeding range is large enough that a single spill, even a major one, would likely only affect a small fraction of the population. This threat has been alleviated in the United States to some degree by stringent regulations for extraction equipment and procedures, traffic separation schemes, shipping lanes that reduce the likelihood of collisions or spills, and improvements in oil spill response, containment, and cleanup. These measures reduce the probability of spills and also may reduce adverse impacts if a spill were to occur.

Foreseeable Future

As discussed above, the brown pelican continues to be affected by a variety of localized, short-term impacts. These localized impacts are generally expected to continue in perpetuity. For example, there is no reason to think that development; hurricanes and other storm events; random human disturbance; fishery activities; oil spills; and infestation by mites, tick, and liver flukes will not continue at some rate indefinitely into the future. Because these impacts are generally limited to one breeding season in duration, occur infrequently, or occur in only a small portion of the range of the species, they are not expected to result in declines in the rangewide status of the species. In order to reliably predict that these impacts may result in endangerment in the foreseeable future, the rate, magnitude, or intensity of the threats would have to increase to the point that population level impacts (e.g., repeated nesting failures) were seen in at least a significant portion of the range of the species. The brown pelican is a long-lived species that breeds multiple years such that sporadic breeding failures have little effect on long-term population stability (Shields 2002, p. 23). In many cases, pelicans will relocate to alternative breeding areas or pelicans from other areas will recolonize affected sites. Current science does not allow us to extrapolate declines in the species' status if threats remain at current levels and further does not allow us to reliably predict that these localized, short-term impacts will change in such a way in the future such that pelicans will respond negatively over a significant portion of the range of the species.

Some diseases such as domoic acid poisoning, erysipelas, and avian botulism occur rarely and are subject to the same fact patterns discussed above concerning short-term, localized threats. When considering diseases such as West Nile virus and avian influenza, it would not be unexpected for either disease to move into the range of the brown pelican; however, the timing, intensity, and response of pelicans across the range of the species cannot be reliably predicted. Thus, the scientific information does not support these diseases as threats to the brown pelican in the foreseeable future.

Predation of chicks and eggs is occurring at a level low enough to allow for populations to recover and expand across the range of the species. This background level of predation is not expected to increase or otherwise change in the future such that this trend would be reversed as a result of predation.

The use of pesticides and contaminants that were known to affect brown pelicans across the range of the species has discontinued in most portions of the range of the species through implementation of bans, laws, and treaties. In order to determine that pesticide and contaminant use may be a threat to the brown pelican in the future, its use must not only be occurring, but be occurring at a level that impacts the long term population levels over at least a significant portion of the range of the species. Current scientific and commercial information simply does not indicate that these two things are happening or that some change will occur allowing it to happen in the future.

The fact that threats are not considered foreseeable does not mean that they are not possible, only that current scientific understanding does not allow us to reliably predict that impacts will increase or that a population decline will result in response to that impact in the future. Given current information on threats and ongoing conservation and management activities, it would be speculative to assume that these impacts will increase to a reliably measureable level, thus it is not foreseeable that the threats will impact the species meaningfully in the future.

In conclusion, the single most important threat to the continued existence of the brown pelican was from DDT, which is now banned in the United States, Mexico, and Canada. In Central and South America and the West Indies, most countries have either banned or restricted use of DDT or made its importation illegal (*http://www.pesticideinfo.org/DetailChemReg.jsp?Rec-Id=PC33482*). Although other localized threats to the brown pelican remain throughout its range, as discussed above, they are at a low enough level that none are likely to have long-term population level or demographic effects on brown pelican populations in the foreseeable future. We believe this species is no longer in danger of extinction throughout its range, nor is it likely to become so in the foreseeable future.

Significant Portion of the Range

Having determined that the brown pelican does not meet the definition of threatened or endangered throughout its range, we must next consider whether there are any significant portions of its range that are in danger of extinction or are likely to become endangered in the foreseeable future. On March 16, 2007, a formal opinion was issued by the Solicitor of the Department of the Interior, ''The Meaning of In Danger of Extinction Throughout All or a Significant Portion of Its Range'' (U.S. Department of the Interior 2007). We have summarized our interpretation of that opinion and the underlying statutory language below. A portion of a species' range is significant if it is part of the current range of the species and it contributes substantially to the representation, resiliency, or redundancy of the species. The contribution must be at a level such that its loss would result in a decrease in the ability to conserve the species. In other words, in considering significance, the Service should ask whether the loss of this portion likely would eventually move the species toward extinction, but not necessarily to the point where the species should be listed as threatened throughout its range.

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

If we identify any portions that warrant further consideration, we then determine whether in fact the species is threatened or endangered in any significant portion of its range. Depending on the biology of the species, its range, and the threats it faces, it may be more efficient for the Service to address the significance question first, or the status question first. Thus, if the Service determines that a portion of the range is not significant, the Service need not determine whether the species is threatened or endangered there; if the Service determines that the species is not threatened or endangered in a portion of its range, the Service need not determine if that portion is significant.

The terms ''resiliency,'' ''redundancy,'' and ''representation'' are intended to be indicators of the conservation value of portions of the range. Resiliency of a species allows the species to recover from periodic or occasional disturbance. A species will likely be more resilient if large populations exist in high-quality habitat that is distributed throughout the range of the species in such a way as to capture the environmental variability found within the range of the species. It is likely that the larger size of a population will help contribute to the viability of the species overall. Thus, a portion of the range of a species may make a meaningful contribution to the resiliency of the species if the area is relatively large and contains particularly high-quality habitat or if its location or characteristics make it less susceptible to certain threats than other portions of the range. When evaluating whether or how a portion of the range contributes to resiliency of the species, it may help to evaluate the historical value of the portion and how frequently the portion is used by the species. In addition, the portion may contribute to resiliency for other reasons—for instance, it may contain an important concentration of certain types of habitat that are necessary for the species to carry out its life-history functions, such as breeding, feeding, migration, dispersal, or wintering.

Redundancy of populations may be needed to provide a margin of safety for the species to withstand catastrophic events. This does not mean that any portion that provides redundancy is a significant portion of the range of a species. The idea is to conserve enough areas of the range such that random perturbations in the system act on only a few populations. Therefore, each area must be examined based on whether that area provides an increment of redundancy that is important to the conservation of the species.

Adequate representation insures that the species' adaptive capabilities are conserved. Specifically, the portion should be evaluated to see how it contributes to the genetic diversity of the species. The loss of genetically based diversity may substantially reduce the ability of the species to respond and adapt to future environmental changes. A peripheral population may contribute meaningfully to representation if there is evidence that it provides genetic diversity due to its location on the margin of the species' habitat requirements.

Applying the process described above for determining whether a species is threatened in a significant portion of its range, we next addressed whether any portions of the range of the brown pelican warranted further consideration. We noted in the five-factor analysis that numerous factors continue to affect brown pelicans in various geographical areas within the range. However, we conclude that these areas do not warrant further consideration because the areas where localized effects may still occur are small (in the context of the range of the species) and affect a few pelicans from one year to the next (such as abandonment of a single breeding colony or entanglement in fishing gear), thus there is no substantial information that these areas are a significant portion of the range. Some areas that may be significant experience short-term or sporadic events (such as the Gulf Coast region experiencing tropical storm events, or Pacific Coast populations experiencing reduced nesting success during an El Niño event), but we do not have substantial information that brown pelicans in these areas are likely to become in danger of extinction in the foreseeable future.

As discussed previously in Distribution and Population Estimates, Recovery Plans, and Factors A and E, declines in wintering numbers of brown pelicans have been noted in Puerto Rico (Collazo *et al.* 2000, p. 40), which superficially suggest that Puerto Rico warrants further consideration. However, Puerto Rico does not represent a large block of high quality habitat, is not known to act as a refugium, and is not known to contain important concentrations of specialized habitat types (e.g., breeding, foraging). As discussed above, brown pelican populations generally are able to recolonize neighboring sites that may have been lost or extirpated during a catastrophic event (e.g., hurricane). In this sense, Puerto Rico contributes to the resiliency of brown pelican populations; however, all brown pelican populations contribute to resiliency in this way and the Puerto Rico populations are not known to contribute more significantly to resiliency than neighboring populations and as such are considered to have a low contribution to the resiliency of the species. Because Puerto Rico represents a small portion of the range of the species, both geographically and in total numbers (240–400 out of 620,000 birds), these populations have a low contribution to the redundancy of the species. Finally, brown pelicans in Puerto Rico belong to the subspecies of brown pelican distributed throughout the West Indies and along the Caribbean coasts of Colombia and Venezuela and are not known to contain any unique genetic materials, morphologies, or behaviors and thus have a low contribution to the representation of the species. While it is important to note that brown pelicans may serve a vital role in the local flora and fauna of Puerto Rico and neighboring areas, these populations are not significant to the species as a whole under the resiliency, redundancy, and representation framework.

In addition to a determination that the Puerto Rico populations are not significant to the conservation of the species, we did not find that these populations are in danger of extinction now or in the foreseeable future. Causes for the apparent decline in number of wintering birds are not known and no specific threats to brown pelicans in Puerto Rico and the Virgin Islands were identified in the five factor analysis above. Although numbers of breeding pelicans in Puerto Rico and the Virgin Islands varied from year to year in both the 1980s and 1990s, there was no trend in breeding pelican numbers that would suggest that the species is in danger of extinction in that area. Nesting sites are protected from development, human disturbance of nesting sites is not known to be limiting, contaminants are not affecting brown pelican populations (Collazo *et al.* 1998, pp. 63–64), and numbers of nesting pairs appear to be holding steady (Collazo *et al.* 2000, p. 42). Juvenile and adult pelicans from the Virgin Islands disperse to Puerto Rico (Collazo *et al.* 1998, p. 63), so proximity to breeding colonies on the Virgin Islands and other islands would likely re-establish the species on Puerto Rico even if it were lost. In the absence of identified threats or evidence that brown pelicans in Puerto Rico represent a significant portion of the species' range, we did not consider this portion of the range further.

INVEMAR (2008) states that pelicans in Colombia may be impacted by a variety of factors including port construction, mangrove deforestation, development, overfishing, pollution, disease, and hunting. However, we have found no information to indicate that these factors are leading to declines in numbers of brown pelican in Colombia. In fact, the seven sites where Moreno and Bulevas (2005, p. 11) document brown pelicans to occur in Colombia all have some form of protection. For example, the largest population in Colombia occurs on Isla Gorgona which is a Parque Nacional Natural, or national park, and is protected from most disturbance. Further, similar to the situation for Puerto Rico, the Colombian populations of brown pelican do not appear to be genetically different from other brown pelicans and this portion of the range does not appear to include a concentration of an important specific habitat type or a large portion of unusually high quality habitat. In summary, in our analysis of the five listing factors, we did not identify any significant continuing threats in any portion of the species range that warrants further consideration.

In conclusion, major threats to brown pelicans have been reduced, managed, or eliminated. Remaining factors that affect brown pelicans occur on localized scales, are short-term events, or affect small numbers of individuals and do not have long-term effects on population numbers or distribution of the species. We have determined that none of the existing or potential threats, either alone or in combination with others, are likely to cause the brown pelican to become in danger of extinction within the foreseeable future throughout all or any significant portion of its range. We believe the brown pelican no longer requires the protection of the Act, and, therefore, we are removing it from the Federal List of Endangered and Threatened Wildlife.

Effect of This Rule

This rule revises 50 CFR 17.11(h) to remove the brown pelican from the List of Endangered and Threatened Wildlife. Because no critical habitat was ever designated for this species, this rule would not affect 50 CFR 17.95.

The prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, no longer apply. Federal agencies are no longer required to consult with us to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of this species. This rulemaking, however, does not affect the protection given to all migratory bird species under the MBTA.

The take of all migratory birds, including brown pelicans, is governed by the MBTA. The MBTA makes it unlawful to at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof (16 U.S.C. 703(a)). Brown pelicans are among the migratory birds protected by the MBTA. The MBTA regulates the taking of migratory birds for educational, scientific, and recreational purposes. Section 704 of the MBTA states that the Secretary of the Interior (Secretary) is authorized and directed to determine if, and by what means, the take of migratory birds should be allowed, and to adopt suitable regulations permitting and governing the take. In adopting regulations, the Secretary is to consider such factors as distribution and abundance to ensure that any take is compatible with the protection of the species. Modification to brown pelican habitat would constitute a violation of the MBTA only to the extent it directly takes or kills a brown pelican (such as removing a nest with chicks present).

Post-Delisting Monitoring Plan

Section 4(g)(1) of the Act requires that the Secretary, through the Service, implement a monitoring program for not less than 5 years for all species that have been recovered and delisted. The purpose of this requirement is to develop a program that detects the failure of any delisted species to sustain itself without the protective measures provided by the Act. If at any time during the monitoring program, data indicate that the protective status under the Act should be reinstated, we can initiate listing procedures, including, if appropriate, emergency listing. At the conclusion of the monitoring period, we will review all available information to determine if relisting, the continuation of monitoring, or the termination of monitoring is appropriate. We proposed a draft post-delisting monitoring plan in the **Federal Register** on September 30, 2009 (74 FR 50236) and expect to finalize that post-delisting monitoring plan within a year.

Paperwork Reduction Act

Office of Management and Budget (OMB) regulations at 5 CFR part 1320, which implement provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*) require that Federal agencies obtain approval from OMB before collecting information from the public. This rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act. This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations.

National Environmental Policy Act

We have determined that Environmental Assessments or Environmental Impact Statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with actions adopted pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of all references we cited is available upon request from the Clear Lake Ecological Services Office (*see* **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this final rule are staff members of the Southwest Regional Office, Albuquerque, New Mexico.

List of Subjects in 50 CFR Part 17

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

Regulation Promulgation

■ Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations as set forth below:

PART 17—[AMENDED]

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Public Law 99–625, 100 Stat. 3500; unless otherwise noted.

§ 17.11 [Amended]

■ 2. Amend § 17.11(h) by removing the entry for ''Pelican, brown'' under BIRDS from the List of Endangered and Threatened Wildlife.

Dated: October 28, 2009.

Christine E. Eustis,

Acting Director, Fish and Wildlife Service.

[FR Doc. E9–27402 Filed 11–16–09; 8:45 am]

BILLING CODE 4310–55–P