

Endangered Species Act 5-Year Review
Caribbean Monk Seal
(Monachus tropicalis)

National Oceanic and Atmospheric Administration
National Marine Fisheries Service

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5-YEAR REVIEW
Caribbean monk seal (*Monachus tropicalis*)

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5-YEAR REVIEW
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1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office

Kyle Baker, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, St. Petersburg, Florida (727) 824-5312

Cooperating Science Centers:

Jason Baker, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Fisheries Science Center, Honolulu, Hawaii

Larry Hansen, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Fisheries Science Center, Beaufort Laboratory, Beaufort, North Carolina

Gordon T. Waring, Northeast Fisheries Science Center, Woods Hole Laboratory, Woods Hole, Massachusetts

Document Peer Reviewed By

Dr. Ian Boyd, University of St. Andrews, Sea Mammal Research Unit, St. Andrews, Scotland

William Johnson, Editor, *The Monachus Guardian*, Bern, Switzerland.

David Laist, Marine Mammal Commission, Bethesda, Maryland, USA

1.2 Method used to complete the review: This review was prepared pursuant to section 4(c)(2) of the Endangered Species Act (ESA) and in accordance with sections 4(a) and (b) of the ESA following guidance provided in the joint NMFS and U.S. Fish and Wildlife 5-Year Review Guidance and template (http://www.nmfs.noaa.gov/pr/pdfs/laws/guidance_5_year_review.pdf). The National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA) initiated a 5-year review of the Caribbean monk seal (*Monachus tropicalis*) in November 2006. NMFS convened a four-member status review team to compile and review information to assess the status of the Caribbean monk seal. NMFS solicited information from the public through Federal Register notice (71 FR 39327; November 29, 2006), as well as through personal and written communications with individuals. NMFS considered the solicited information from the public, a literature review, and current information regarding pinniped sightings in the southeast U.S. and Caribbean regions to assess the possibility that this species continues to exist in the wild. To complete the 5-year review, we evaluated all information that has become available on the species since 1984, the date of its last biological status review.

1.3 Background

1.3.1 FR Notice citation announcing initiation of this review

NMFS announced initiation of the 5-year review for Caribbean monk seals (*M. tropicalis*) and asked the public to submit information regarding the species' status on November 29, 2006 (71 FR 39327). Comments were received and incorporated as appropriate into the 5-year review.

1.3.2 Listing history

Original Listing (under Endangered Species Preservation Act of 1966)

FR notice: 32 FR 4001

Date listed: March 11, 1967

Entity listed: entire species

Classification: endangered

Revised Listing

FR notice: 44 FR 21288

Date listed: April 10, 1979

Entity listed: entire species

Classification: endangered

1.3.3 Associated rulemaking

None.

1.3.4 Review History

Monk Seal 5-Year Review: November 9, 1984

A Caribbean monk seal 5-year review published on November 9, 1984, determined that the best available information indicated the Caribbean monk seal is extinct. No sightings or evidence of Caribbean monk seals have been documented since the last confirmed sighting at Seranilla Bank, between Jamaica and the Yucatán Peninsula, in 1952. Therefore, the 5-year review recommended that the species be removed from the list of endangered and threatened species under the ESA (49 FR 44774). Following the 1984 status review, the U.S. Marine Mammal Commission contracted a study to interview local fishermen, residents, and sailors along the north coast of Haiti (Woods and Hermanson 1987). Although there were two reported seal sightings obtained during the survey, there was no tangible evidence to confirm whether those sightings involved Caribbean monk seals or some other species. A subsequent survey of fishermen in waters of Haiti and Jamaica also reported oral accounts of seal sightings, but again, there was no corroborating proof that the sightings involved seals, much less Caribbean monk seals (Boyd and Stanfield 1998). Based on the results of these surveys, NMFS decided not to delist the species, due the possible existence of a remnant population in the wild.

1.3.5 Species' Recovery Priority Number at Start of 5-year Review

Because this species is likely extirpated throughout its range, the NMFS October 1, 2004-September 30, 2006 Biennial Report to Congress on the Recovery Program for Threatened and Endangered Species assigned the recovery priority number for the Caribbean monk seal as 12. This represents a low magnitude of threat as a rare population, a low recovery potential, and the absence of conflict with economic activity.

1.3.6 Recovery Plan or Outline

No recovery plan has been prepared for the Caribbean monk seal. Upon the species' revised listing under the ESA in 1979, there was no known population existing in the wild. No information was available upon which a recovery plan could be based.

2.0 REVIEW ANALYSIS

2.1 Application of the 1996 Distinct Population Segment (DPS) policy

The Caribbean monk seal is a vertebrate and subject to the DPS Policy (61 FR 4722). The species has not been sighted since 1952. There is no information to indicate there is a remaining population of this species, much less more than one. Identification of DPS' is not appropriate for the Caribbean monk seal.

2.2 Recovery Criteria

Recovery plans contain downlisting and delisting criteria with regard to a species' status and threats. A recovery plan has not been prepared for the Caribbean monk seal because no populations of this species were known to exist at the time of listing.

2.3 Updated Information and Current Species Status

No confirmed sightings of Caribbean monk seals have been reported since the last status review conducted in 1984. Following the 1984 review, the U.S. Marine Mammal Commission contracted a study to interview fishermen, residents, and sailors along the north coast of Haiti (Woods and Hermanson 1987). Although potential accounts of seal sightings were obtained during the survey, no confirmations were obtained. However, based upon a credible account of a sighting, some isolated animals were believed to potentially remain in some remote regions. A subsequent survey of fisherman working in waters of the Caribbean monk seal's former range provided circumstantial evidence that the species may still exist in the wild (Boyd and Stanfield 1998). Since this time there has been no new information regarding this species. A review of sightings and stranding data provided evidence of several positively identified arctic phocids in tropical and sub-tropical waters of the Western North Atlantic from 1917 through 1996 (Mignucci-Giannoni and Odell 2001). Due to confirmed sightings of extralimital arctic species in the Caribbean region, mostly hooded seals (*Cystophora cristata*), and lack of any Caribbean monk seal sightings since 1952, the authors concluded that unidentified sightings in the period reviewed were not Caribbean monk seals (Mignucci-Giannoni and Odell 2001). Between 1996 and 2007, 22 additional sightings of hooded seals have been confirmed in southeast U.S. waters, of which 7 occurred in the Caribbean (Southeast U.S. Marine Mammal Stranding Database 2007).

2.3.1 Taxonomic Classification and Phylogeny:

The type specimen for the Caribbean monk seal, also known as the Caribbean seal, the West Indian seal, and the West Indian monk seal, was described from the scientific literature in 1849 from a specimen taken in Jamaica (Gray 1849). Early references to this species referred to these

animals as sea wolves, hair seals, or simply seals. In Spanish, the Caribbean monk seal is known by many names, including: cabezas de friales, foca caribeña, foca del Caribe, foca monje caribeña, foca monje de las Antillas, foca monje del Caribe, fraile marino, lobo del mar, lobo marino, and pez boto (Mignucci-Giannoni 1989). Although the species has several common names, it is taxonomically described below.

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Subclass: Eutheria
Order: Carnivora
Suborder: Pinnipedia
Family: Phocidae
Subfamily Monachinae
Genus: *Monachus*
Species: *tropicalis*

A thorough description of the Caribbean monk seal was recently completed by Adam (2004). The genus *Monachus* includes 3 allopatric species: *M. tropicalis* (Caribbean monk seals), *M. schauinslandi* (Hawaiian monk seals), and *M. monachus* (Mediterranean monk seals). Caribbean monk seals are more closely related to Mediterranean monk seals than to Hawaiian monk seals (Wyss 1988). However, the phylogenetic relationship among monk seals remains in dispute (Lavigne 1998). No genetic studies of Caribbean monk seals have been conducted.

2.3.2 Biology

The Caribbean monk seal has a typical seal-like appearance, with a well-developed blubber layer, flipper-like limbs, a short tail, and a smooth body contour. The head is large and prominent, eyes are large and light reddish-brown in color (Ward 1887), and external pinnae are absent. Pups are born black in color and remain that way for about one year (Allen 1887b). Adult pelage is variably dark dorsally (brown to black) and graded into a lighter yellowish-white countershade ventrally. Ventral fur ranges from pale yellow to yellowish-gray or yellowish-brown and is sometimes mottled with darker patches. The front and sides of the muzzle and the edge of the full and fleshy lips are yellowish-white.

Caribbean monk seals are sexually dimorphic, with females smaller than males (Allen 1887a). However, the size difference is slight and could not be used to distinguish between the sexes. The two sexes are also alike in color and form (Allen 1887a). Females have 2 pairs of functional mammae (Ward 1887). Measurements of adults of both sexes generally range between 2.0-2.5 m (Allen 1887a; Allen 1887c, Ward 1887). The only known photographs of Caribbean monk seals in the wild appear in Adam and Garcia (2003). The best photograph of this species was taken at the New York Aquarium in 1910 (Figure 1).



Figure 1. A 1910 photograph of Caribbean monk seal at the New York Aquarium. Specimen captured in Campeche Bank region as described in Townsend (1909).

Caribbean monk seal vocalizations have been described as roaring, pig-like snorting, moaning, dog-like barks, growls, and snarls (Gosse 1851, Hill 1843, Nesbitt 1836, Townsend 1909). Pup vocalizations have been reported as a long, drawn out, guttural “ah” with a series of vocal hitches during enunciation (Ward 1887). Underwater vocalizations of Caribbean monk seals have not been described and are unknown. As with both Hawaiian and Mediterranean monk seals, Caribbean monk seals apparently became sensitized to human presence after exposure to hunting or other abusive treatment. Thus, although many recent descriptions of monk seals state that they are highly sensitive to human disturbance, some accounts, including early accounts of the species (e.g., E.W. Nelson, as cited in Adam and Garcia 2003), describe them as being very approachable when hauled out on beaches.

Both Mediterranean and Hawaiian monk seals are known to consume a variety of fish, cephalopods, and crustaceans (Marchessaux 1989, Goodman-Lowe 1998), and it has been speculated that Caribbean monk seals have a similar diet (Nesbitt 1836, Gosse 1851, Ward 1887). The three species of *Monachus* have no obvious functional dental or osteological features to suggest that their feeding habits are significantly different from each other (Adam and Berta 2002).

The incidence of disease in the wild has not been reported, but an occurrence of a condition that may have been cataracts has been noted (Gaumer 1917, Ward 1887). The nasal mite *Halarachne americana* was recovered in great numbers and in all stages of its life cycle from the respiratory passages of a single captive specimen. The mite, which is only known from Caribbean monk seals and has not been identified from any other species or habitats since that time, may now be extinct (Adam 2004). Caribbean monk seals were reported to have heavy parasitic helminth loads (Adam and Garcia 2003, Ward 1887), but a detailed description and species identification has not been reported.

2.3.3 Life History

Most observations of life history and behavior of Caribbean monk seals are based on short-term observations of seals in isolated colonies following heavy exploitation of the species. Due to the decline of this species after the arrival of the Europeans in the wider Caribbean region and its rarity by the time the species was first described in the scientific literature, remarkably little is

known about its life history. Prior to its depletion, Caribbean monk seals hauled out in groups of up to 500 individuals (Nesbitt 1836). Accounts of Caribbean monk seals are usually from isolated islands, keys, and atolls surrounded by shallow, reef-protected waters, and only occasionally from mainland beaches. Haul out sites are usually sandy beaches that remain exposed at high tide (Gaumer 1917 and Hill 1843, as summarized in Adam 2004, Kerr 1824, Ward 1887), but also include near shore rocks and rocky islets (Allen 1880). Haul out sites typically have sparse or no vegetation and no fresh water (Ward 1887). Adam and Garcia (2003) and Ward (1887) reported that they usually hauled out on beaches to rest in the early morning, although sometimes they would haul out and rest overnight.

Very little is known about the effects of over-exploitation on sex ratios of the species. The male:female ratio of specimens collected during a 1900 expedition in Mexico was 24:76, but by then the species was already severely depleted. Because such data are limited to a single sample size from one colony, it is not possible to determine whether that reported sex ratio is representative, reflective of previous hunting on the sex ratio of the population, or due to some other unknown factor. The relevance of those data to life history characteristics must therefore be interpreted with caution.

Observations of feeding seals have not been reported, and there are no reports of prey items from the few examinations of stomach contents cited in the available literature. Pregnant females are known only from the Triangle Keys off Mexico, where a newborn suckling pup and 5 females with fetuses were collected in early December 1886 (Ward 1887) and a single pregnant seal was killed in late June 1900 (original unpublished field notes of W.E. Nelson as cited in Adam and Garcia 2003). Adam and Garcia (2003) speculate that Caribbean monk seals have low pupping synchrony due to the limited seasonal variations in climate and prey abundance. An annual birth rate of 15% has been calculated, but this is likely an underestimate (Rice 1973). Rice (1973) concluded that females rarely bore young in successive years and likely produced a pup every other year; however, research on Hawaiian monk seals (Johanos et al. 1994) and Mediterranean monk seals (Johnson et al. 2006) has demonstrated that pupping in successive years is common for those species. Weaning reportedly began 2 weeks after parturition; however, this also may be an underestimate based on weaning behavior in Hawaiian and Mediterranean monk seals. Pups apparently developed quickly (Nesbitt 1836). Subadult seals are speculated to have foraged nocturnally in shallow, nearshore waters to avoid direct competition with adults, which fed at dawn and dusk (Adam and Garcia 2003). Caribbean monk seals have been estimated to have a life span of 20-30 years (Adam 2004), but long-term studies of the species in the wild are lacking. However, this estimate is consistent with that of Hawaiian monk seals, which is thought to have a life span of approximately 25-30 years.

2.3.4 Distribution

The historic distribution of Caribbean monk seals (Figure 2) has been inferred from historical sightings, archeological records, fossil evidence, and geographical features bearing names suggestive of their presence (Adam and Garcia 2003, Adam 2004). The species' northernmost record is from a fossil recovered near Charleston, South Carolina. There is evidence that Caribbean monk seals used mainland beaches of North or Central America as haul-out sites in great numbers. Most sightings records are from isolated islands, cays, and reefs in the eastern Gulf of Mexico (Ray 1961, Timm et al. 1997) and western Caribbean Sea. The only evidence Caribbean monk seals occurred in the Lesser Antilles is from archeological remains in

the northern end of the chain (Wing 1992) and a single sighting record (Timm et al. 1997). A few sighting records, archeological finds, and suggestive place names extend the known range of Caribbean monk seals to include the northern coast of South America (Timm et al. 1997 and Debrot 2000).

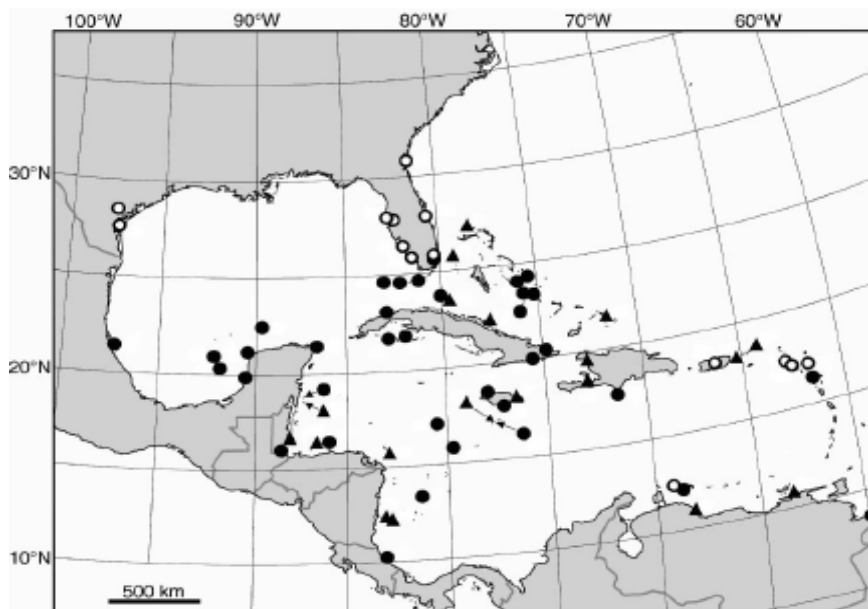


Figure 2. Distribution of *M. tropicalis* in the western tropical Atlantic region based on historical records (closed circles), archaeological and fossil records (open circles), and localities with names suggestive of occurrence (triangles) such as Lobos Cay (Cuba), Lobos Cay (Honduras) Cayo Lobo Marino (Nicaragua), Seal Keys (Bahamas), and Isla de Lobos (Veracruz). For a description of the source and location data used to define the distribution of Caribbean monk seals, see Adam and Garcia 2003, Adam 2004, and Timm et al. 1997. Figure from Adam (2004).

2.3.5 Factors Contributing to the Decline of Caribbean Monk Seals

Although documentation of harvest levels and practices that led to this species' population decline is nearly absent, it is evident from early reports that relatively large numbers of seals persisted in at least some areas as late as the early 1800s and that their precipitous decline in abundance was due to heavy exploitation by sealers and other people. During the 1800s their distribution became increasingly fragmented. By the time scientific expeditions were organized in the late 1800s to document and study the species, their range was already drastically curtailed. Rice (1973) concluded that the last confirmed sighting of this species was in 1952 at Seranilla Banks in the western Caribbean.

When determining whether a species is threatened or endangered, we evaluate the five factors under ESA section 4(a)(1) to specify the reasons for the species' status:

1. Present or threatened destruction, modification or curtailment of its habitat or range;
2. Overutilization for commercial, recreational, scientific, or educational purposes;

3. Disease or predation;
4. Inadequacy of existing regulatory mechanisms; and
5. Other natural or manmade factors affecting its continued existence.

A five-factor analysis of the current threats to the species is superfluous since the species has not been sighted in over 50 years; however, we can review the factors contributing to this species' drastic decline. The Caribbean monk seal population was already severely depleted, and likely extirpated throughout most, if not all, of its range prior to the passage of the ESA and Marine Mammal Protection Act. The two main factors leading to its listing as endangered are the modification and curtailment of its habitat and range, and overutilization for commercial and educational purposes.

2.3.5.1 Present or threatened destruction, modification or curtailment of its habitat or range

When hauled out on beaches, Caribbean monk seals were reported to have been sensitive to human disturbance (Allen 1880, Gaumer 1917, Ward 1887). When disturbed, they reportedly returned to the water where they remained until the people or vessels left the area (Adam and Garcia 2003, Allen 1880). As human settlements expanded in areas inhabited by this species and persistent hunting reinforced evasive seal behaviors, avoidance of human presence near populated shorelines and areas regularly visited by fishermen likely caused seals to abandon historic haul-out sites. Human encroachment also likely exacerbated stresses on the population as it declined. Although the species was reported as common in the early to mid-1700s, it was already considered rare by the mid-1880's (Allen 1887b, Elliot 1884, Gratacap 1900).

2.3.5.2 Overutilization for Commercial and Educational Purposes

Caribbean monk seals were utilized as a source of meat by early mariners and heavily exploited as a source of oil following European colonization (Allen 1880). Other human-caused factors such as entanglement and drowning in fishing nets and slaughter by fishermen viewing the seals as competitors for fish contributed to their decline (Rice 1973). Caribbean monk seals were also killed for scientific collection and study, as well as for display in zoological gardens. Adam (2004) provides an excellent review on the historical exploitation of Caribbean monk seals. He reports the species was the most readily exploited source of oil in the tropical West Atlantic Ocean prior to the early 1800s, and that they were hunted to near extinction for their blubber until the early 1900s.

Blubber was processed and used for lubrication, coating the bottom of boats, and as lamp and cooking oil. Caribbean monk seal skins were sought to make trunk linings, articles of clothing (e.g., caps and belts), straps, and bags. In the early 1700s, a girdle fashioned from a Caribbean monk seal pelt was believed to relieve lower back pain. At least some sailors reportedly prized monk seal pelts believing that their hairs became erect during rough seas, but remained flat in calm seas. The Swiss naturalist Konrad Gesner reported accounts from seafarers in the Caribbean (near the island of Hispaniola) in the 1550s, writing: "Its hair is reputed to be of such a wondrous nature that the skins or belts are worn by mariners. When thunderstorms, tempests and other inclement weather is nigh, the hair shall rise and bristle, but when it turns still and mild, it shall lay down smoothly" (Gesner 1558, as cited in Johnson 2004).

Caribbean monk seals were taken for food by sailors stranded on the Arricifés Viboras (Cuba) in 1520, on the Islas de Lobos (Veracruz, Mexico) in 1524, Dry Tortugas (Florida) in 1742, and in the Triangle Keys (Mexico) in 1846. Guano gatherers visiting the Triangle Keys in 1856 reportedly made a bonfire of 100 barrels of Caribbean monk seal skins and skeletons left behind by sealers, suggesting that they were heavily exploited for their oil in this region. Fishermen sometimes hunted the seals for meat until about 1885. In at least one instance, two monk seals were killed simply “for fun” (Allen 1880). Aside from heavy hunting pressure by humans, the only known natural predator reported is an unidentified species of shark (Fernández de Oviedo 1944).

As a result of this species’ increasing rarity in the wild, live specimens were eagerly sought by zoological gardens following the discovery of remnant populations in the late 1800s. In 1897, two live specimens sold for \$50.00 each, and dead or mounted specimens also were sold to museums. Two scientific expeditions to the Triangle Keys are believed to have contributed to the extirpation in that region. On four days in December 1886, 49 seals were killed in the Triangle Keys (Allen 1887, Ward 1887). Live specimens obtained by the New York Aquarium in 1897 and 1909 also were captured from the Triangle Keys (Townsend 1909).

2.4 Synthesis

Since passage of the ESA, several efforts have been made to investigate unconfirmed reports of the species in or near the Caribbean Sea, Gulf of Mexico, the Southern Bahamas, and Atlantic coast of the Greater Antilles. There have been several reports of pinnipeds within the range of Caribbean monk seals since the last authoritative sighting at the Seranilla Banks in 1952. Unconfirmed sightings of pinnipeds up to that time resulted in speculation that the Caribbean monk seal still existed in a few, isolated colonies as late as the mid 1900s. The historical accounts of the species, unsuccessful expeditions to locate remnant colonies, and confirmed sightings of pinniped species other than Caribbean monk seal within the species’ historical range now provide useful perspective on the species’ decline. The following provides a brief historical account of sightings and survey efforts for the species.

1494: The first sightings records of Caribbean monk seals were made during the second voyage of Columbus, when 8 individuals were killed for their meat (Kerr 1824).

1700s to 1900s: Caribbean monk seals were exploited intensively for their oil, and to a lesser extent for food, scientific study, and zoological collection following European colonization.

1886: Caribbean monk seals were reported to occur in the Triangle Keys in the Gulf of Campeche, where 49 seals were killed during a scientific expedition. (Ward 1887)

1897: The New York Aquarium acquired two specimens captured from the Triangle Keys. (Townsend 1909)

1906: On February 25, 1906, fishermen killed a Caribbean monk seal five miles off Key West, Florida. The 1906 account was the first sighting of the species in Florida in approximately 30 years. (Townsend 1906)

1909: The New York Aquarium received four live Caribbean monk seals from a dealer in Progreso, Yucatán. At the time, the last known population of the Caribbean monk seal was restricted to islands and reefs off the Yucatán, Mexico. (Townsend 1909)

1922: A monk seal was killed by a fisherman near Key West, Florida, on March 15, 1922. This was the last confirmed sighting of the seal in the United States. Townsend noted a small breeding colony still remained in the Triángulos reef group (i.e., the Triangle Islands) in the Campeche Bank islands off Mexico (Townsend 1923)

1932: Following interviews with men having seen seals in the lower Laguna Madre region of Texas, Gordon Gunter concluded that a few Caribbean monk seals were scattered along the Texas coast as late as 1932 (Gunter 1947). It was later suggested that the sightings of seals along the Texas coast were probably feral California sea lions (*Zalophus californianus*) (Gunter 1968).

1952: C.B. Lewis observed the last authoritative sighting of Caribbean monks at a small seal colony off Seranilla Banks (Colombia) in 1952, located between Jamaica and the Yucatán peninsula. (Rice 1973)

1973: The International Union for the Conservation of Nature (IUCN) distributed circulars in both English and Spanish throughout the Caribbean region in 1973, offering U.S. \$500 for information on recent sightings of the species. No confirmed sightings were made. (Boulva 1979)

1973: The U.S. Fish and Wildlife Service conducted aerial surveys off the Yucatán, south to Nicaragua, and east to Jamaica of all the areas where Rice suggested that Caribbean monk seals may still exist. The species was not sighted in the survey area. (Kenyon 1977)

1980: Canada's Department of Fisheries and Oceans, Arctic Biological Station supported a search for evidence of Caribbean monk seals in remote islands of the southeastern Bahamas by vessel and interviews with local fishermen. The vessel survey produced no sightings of seals. Interviews with fishermen produced a few new accounts of seals in the area during the 1960s and 1970s, but the sightings could not be confirmed as Caribbean monk seals. (Sergeant et al. 1980)

1984: From September 5-15, 1984, a survey was conducted across the Gulf of Mexico to Campeche, Mexico, aboard the Scripps Institution of Oceanography research vessel, *Robert G. Sproul*. The survey crew landed at three island groups off the north coast of the Yucatán Peninsula considered possible haul-out sites still used by monk seals: Islas Triangulos, Cayo Arenas and Arrecife Alacran. Another island, Cayo Arcas, was visited by helicopter on September 7, 1984. The survey yielded no seal sightings or evidence of their continued existence. (LeBoeuf et al. 1986)

1985: The United States Marine Mammal Commission contracted for a survey of local fishermen, coastal residents, and sailors in northern Haiti. Two of 77 people interviewed reported having seen a seal, one of which - a sighting at Île Rat in the Baie de l'Acul in 1981 - was considered a reliable account. In neither case, however, was it possible to confirm the sighting as a Caribbean monk seal. (Woods and Hermanson 1987)

1996: The IUCN Seal Specialist Group listed the Caribbean monk seal as extinct on its Red List of threatened and endangered species. (Seal Specialist Group 1996)

1997: Based on interviews with 93 fishermen in northern Haiti and Jamaica during 1997, it was concluded that there was a likelihood that Caribbean monk seals may still survive in this region of the West Indies. Fishermen were asked to select marine species known to them from randomly arranged pictures: 22.6% (n=21) selected monk seals of which 78% (n=16) had seen at least one in the past 1-2 years. (Boyd and Stanfield 1998)

2001: A review of seal sightings and marine mammal stranding data in the Southeast U.S. and Caribbean region documented evidence of several pinnipeds positively identified as arctic phocids between 1917 through 1996 that had strayed into the tropical and subtropical waters of the Western North Atlantic. Due to confirmed sightings of extralimital arctic species, mostly hooded seals (*Cystophora cristata*) in the Caribbean region, confirmed sightings and recaptures of feral California sea lions *Zalophus californianus*) that had escaped from captivity, and lack of any confirmed Caribbean monk seal sightings since 1952, the authors concluded that unidentified sightings since 1952 were likely species other than Caribbean monk seals. (Mignucci-Giannoni and Odell 2001)

2007: Between 1996 and 2007, 22 additional, confirmed sightings of hooded seals have been reported from the tropical and subtropical waters of the Western North Atlantic, including seven from the Caribbean Sea. (Southeast U.S. Marine Mammal Stranding Database data 2007)

Although Caribbean monk seals could be cryptic while at sea and a low number of individuals in a population may lower the detectability of individuals, hauled out individuals at rest or females with pups would be conspicuous to an observer. The United Nations Environment Programme, Caribbean Environment Programme was contacted in December 2007 regarding any new information on surveys or sightings of Caribbean monk seals that may have been missed by NMFS review of sightings and stranding data; however, the inquiry resulted in no new information. With pervasive human presence in the wider Caribbean region and the necessity for seals to haul-out to rest and pup, it would be expected that any remaining individuals in the wild would have been sighted and confirmed over the past 50 years. Furthermore, there are few, if any, remaining areas where Caribbean monk seals were known to occur that have not been frequented by at least periodic human visits (e.g., fishing activities, recreational activities, and scientific expeditions). No Caribbean monk seal sightings have been reported from the numerous scientific surveys conducted in the former range of the species (e.g., avian nesting colonies, sea turtle nesting beaches, coral reef studies, and other biological and ecological research). Fishermen, shrimping boats, and abandoned camps have been ubiquitous throughout the species' known hauling grounds for decades (Kenyon 1977, LeBoeuf et al. 1986).

Because the range of Caribbean monk seals lies well outside the normal distribution of all other pinnipeds, sightings of seals are remarkable events in the wider Caribbean region. However, NMFS' analysis of stranding data shows that the extralimital occurrence of arctic phocids occurs with some regularity. Current technology allows for near real-time communication when such rare or unusual species are sighted. Better methods also exist to confirm species identification

when such sightings are made (e.g., photographs and genetic analysis of tissue samples). Although some seal sightings inevitably are not identifiable to a particular species, all those that have been confirmed in recent decades within the known range of the Caribbean monk seal have proven to be other species, namely feral California sea lions (Rice 1973), manatees (*Trichechus manatus*), or hooded seals (Mignucci-Giannoni and Odell 2001, NMFS Southeast U.S. Marine Mammal Stranding Database data 2007). The extralimital occurrence of juvenile hooded seals in subtropical and tropical waters occurs with enough frequency to account for most recent pinniped sightings within the former range of the Caribbean monk seal (Mignucci-Giannoni and Haddow 2002, Mignucci-Giannoni and Odell 2001).

A sufficient amount of time has passed since the last sighting of this species to make an inference on the status of this species. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the World Conservation Union have set 50 years with no sightings as the cut-off for species extinction (World Conservation Union 1982). In 1949, the International Conference on the Protection of Nature (United Nations Scientific Conference on the Conservation and Utilization of Resources) included the Caribbean monk seal in a list of 14 mammals whose survival was considered to be a matter of international concern requiring immediate protection (Westermann 1953). However, the last confirmed sighting of the species occurred in 1952, limiting any opportunity for conservation efforts of any remaining animals in the wild. It has been over 50 years since the last confirmed sighting of Caribbean monk seals in the wild despite multiple survey efforts to locate the species. Solow (1993) utilized survey data of Caribbean monk seals to demonstrate statistically that the likelihood of extinction is high based on the lack of sightings of this species. The International Union for the Conservation of Nature and Natural Resources concluded the Caribbean monk seal was extinct in 1996 (Seal Specialist Group 1996), but the species remained listed under the ESA in the United States based on a possibility that some Caribbean monk seals persisted for a few years after their last confirmed sighting in 1952 at Seranilla Bank.

Although there were no sightings, it is possible that the Caribbean monk seal persisted for a short period in the years following the last confirmed sighting in 1952 at Seranilla Bank. If so, with an estimated life span of 20-30 years, some individuals may have possibly persisted into the 1960's or 1970's. If any remnant population did survive, it seems likely they consisted of scattered individuals, with no remaining colonies large enough to be viable in the wild. Considering the absence of confirmed seal sightings since 1952, the fact that all confirmed seal sightings have been of other species, and the ubiquitous presence of humans throughout the species' range, the Caribbean monk seal appears to have been extirpated before any meaningful conservation and recovery efforts could be taken for the species.

We believe our review has complied with the statutory requirements of section 4(a), 4(b), and 4(c)(2) of the ESA. Based upon our review of the status of this species, we conclude that the Caribbean monk seal is extinct, primarily due to human exploitation.

3.0 RESULTS

3.1 Recommended Classification

Although there have been recent reports of seal sightings within the historical range of Caribbean monk seals, all verified sightings have involved accounts of other pinnipeds outside their normal range or misidentified manatees. Based on review of the best available information, there have been no confirmed sightings of Caribbean monk seals since 1952. We can find no new information to support a conclusion that this species may continue to exist in the wild. Therefore, it is recommended that the Caribbean monk seal be delisted due to extinction.

- Downlist to Threatened
- Uplist to Endangered
- Delist (*Indicate reasons for delisting per 50 CFR 424.11*):
- Extinction
- Recovery
- Original data for classification in error
- No change is needed

3.2 New Recovery Priority Number:

No change is needed until delisting actually takes place.

Brief Rationale: The species' current recovery priority number is 12, representing a low magnitude of threat as a rare population, a low recovery potential, and the absence of conflict with economic activity.

3.3 Listing and Reclassification Priority Number: _

Delisting Priority Number: 6 _

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

This status review concludes the Caribbean monk seal is extinct. It is recommended this species be removed from the Endangered Species Act list of threatened and endangered species through the rulemaking process. Although no future management actions are required, genetic samples should be isolated from bones and pelts in existing scientific collections for future reference and analysis. Genetic characterization of the species should occur while good samples of the species remain available.

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**NATIONAL MARINE FISHERIES SERVICE
ENDANGERED SPECIES ACT 5-YEAR REVIEW
Caribbean Monk Seal (*Monachus tropicalis*)**

Current Classification: Endangered

Recommendation resulting from the 5-Year Review

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change is needed

Review Conducted By:

Lead Regional Office

Kyle Baker, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, St. Petersburg, Florida.

Cooperating Science Centers

Jason Baker, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Fisheries Science Center, Honolulu, Hawaii.

Larry Hansen, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Fisheries Science Center, Beaufort Laboratory, Beaufort, North Carolina.

Gordon T. Waring, Northeast Fisheries Science Center, Woods Hole Laboratory, Woods Hole, Massachusetts.

REGIONAL OFFICE APPROVAL:

Regional Administrator, National Marine Fisheries Service

Approve:  Date: 2/28/08

HEADQUARTERS APPROVAL:

Assistant Administrator for Fisheries

Concur Do Not Concur

Signature  Date 3/7/08