U.S. FISH AND WILDLIFE SERVICE SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

Scientific Name:

Emballonura semicaudata semicaudata

Common Name:

Pacific Sheath-Tailed Bat

Lead region:

Region 1 (Pacific Region)

Information current as of:

06/19/2014

Status/Action

___ Funding provided for a proposed rule. Assessment not updated.

___ Species Assessment - determined species did not meet the definition of the endangered or threatened under the Act and, therefore, was not elevated to the Candidate status.

___ New Candidate

_X_ Continuing Candidate

___ Candidate Removal

> ___ Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status
>
> ___ Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species
>
> ___ Range is no longer a U.S. territory
>
> ___ Insufficient information exists on biological vulnerability and threats to support listing
>
> ___ Taxon mistakenly included in past notice of review
>
> ___ Taxon does not meet the definition of "species"
>
> ___ Taxon believed to be extinct
>
> ___ Conservation efforts have removed or reduced threats

___ More abundant than believed, diminished threats, or threats eliminated.

Petition Information

___ Non-Petitioned

_X_ Petitioned - Date petition received:

90-Day Positive:

12 Month Positive:

Did the Petition request a reclassification? **No**

For Petitioned Candidate species:

Is the listing warranted(if yes, see summary threats below) **Yes**

To Date, has publication of the proposal to list been precluded by other higher priority listing? **Yes**

Explanation of why precluded:

Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for this species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The Progress on Revising the Lists section of the current CNOR (http://endangered.fws.gov/) provides information on listing actions taken during the last 12 months.

Historical States/Territories/Countries of Occurrence:

- **States/US Territories**: American Samoa
- **US Counties**: Manu'a, AS
- **Countries**: United States

Current States/Counties/Territories/Countries of Occurrence:

- **States/US Territories**: American Samoa
- **US Counties**: Manu'a, AS
- **Countries**: United States

Land Ownership:

Land ownership in American Samoa generally follows a historic village tradition. Large sections of land around each village are controlled by that village for the use by the village residents. The last known major Pacific sheath-tailed bat roosting caves on Tutuila, American Samoa, are part of customary lands belonging to the village of Afono.

Lead Region Contact:

ARD-ECOL SVCS, Jesse D'Elia, 5032312349, jesse_delia@fws.gov

Lead Field Office Contact:

PACIFIC ISLANDS FISH AND WILDL OFC, Kristi Young, 808-792-9419, kristi_young@fws.gov

Biological Information

Species Description:

This small bat, forearm length about 45 millimeters (1.8 inches), weight 5.5 grams (0.19 ounces), is a member of the Emballonuridae, an Old World bat family that has an extensive distribution primarily in the tropics (Nowak 1994). The Pacific sheath-tailed bat was once common and widespread in Polynesia and Micronesia and is the only insectivorous bat recorded from a large part of this area (Hutson et al. 2001). Sheath-tailed bats are rich brown to dark brown above and paler below (Walker and Paradiso 1983). The common name sheath-tailed bat refers to the nature of the tail attachment; the tail pierces the tail membrane and its tip appears completely free on the upper surface of the membrane (Walker and Paradiso 1983). The biology of this species, including detailed information on reproduction, habitat use, and diet, is largely unknown (Hutson et al. 2001; Wiles and Worthington 2002).

Taxonomy:

The classification of this species has received varied treatment, but the most thorough and recent taxonomic evaluation for this species was conducted by Karl Koopman (Koopman 1997; Wiles and Worthington 2002). Koopman (1997) recognizes four subspecies: *Emballonura semicaudata* ssp. *rotensis*, endemic to the Mariana Islands (Guam and the Commonwealth of the Northern Mariana Islands (CNMI)); *E. s. sulcata*, occurring in Chuuk and Pohnpei; *E. s. palauensis*, found in Palau; and *E. s. semicaudata*, occurring in American and Independent Samoa, Tonga, Fiji, and Vanuatu. This assessment addresses the population of *E. s. semicaudata* that occurs in American Samoa. After review of the available taxonomic information, we conclude that *E. s. semicaudata* is a valid subspecies.

Habitat/Life History:

The Pacific sheath-tailed bat is a small bat that appears to be cave-dependent, roosting during the day in a wide range of caves, including overhanging cliffs, crevices, and lava tubes (Grant 1993; Grant et al. 1994; Hutson et al. 2001; Palmeirim et al. 2005). Bats and cave swiftlets (*Aerodramus* spp.) may be found sharing caves (Lemke 1986; Hutson et al. 2001; Tarburton 2002: Wiles and Worthington 2002). Large roosting colonies appear fairly common in the Palau subspecies, but smaller aggregations may be more typical of at least the Mariana Island subspecies and perhaps other *Emballonura* (Nowak 1994; Flannery 1995; Wiles et al. 1997; Wiles and Worthington 2002). The subspecies that occurs on Aguiguan appears to prefer relatively large caves (Guam Division of Aquatic and Wildlife Resources (GDAWR) 1995). The Pacific sheath-tailed bat is nocturnal and typically emerges around dusk to forage on insects (Hutson et al. 2001). Survey work on Aguiguan in 2003 revealed that the Mariana Islands subspecies foraged almost entirely in forests (native and nonnative) near their roosting caves (Esselstyn et al. 2004). Bruner and Pratt (1979) also observed sheath-tailed bats foraging in native forests on Pohnpei.

Historical Range/Distribution:

American Samoa is made up of seven islands (Tau, Ofu, Olosega, Tutuila, Aunuu, Rose Atoll, and Swains Island). The Pacific sheath-tailed bat formerly occurred on Tau, Ofu, Olosega, collectively known as the Manua (Tau) Islands, Tutuila, and Aunuu (Amerson et al. 1982; Flannery 1995; Helgen and Flannery 2002; Department of Marine and Wildlife Resources (DMWR) 2006).

Current Range Distribution:

A precipitous decline of the Pacific sheath-tailed bat on the island of Tutuila has been documented since around 1990 (Amerson et al. 1982; Knowles 1988, Grant et al. 1994; Koopman and Steadman 1995; Helgen and Flannery 2002), and this subspecies may now be extirpated from American Samoa (Grant et al. 1994; Utzurrum 2005, pers. comm.; DMWR 2006). In an attempt to ascertain whether the species is still extant, DMWR conducted surveys consisting of acoustic sweeps and cave checks on all of the main islands (Tulafono 2006, pers. comm.). Surveys were completed in 2008, and a publication is planned by Dr. Ruth Utzurrum on the results of those surveys. No Pacific sheath-tailed bats were detected during those surveys. New surveys using different methodology are planned to begin in FY2012 (Tulafono 2011, pers.comm.).

Population Estimates/Status:

In American Samoa, Amerson et al. (1982) estimated a total population of approximately 11,000 Pacific sheath-tailed bats in 1975 and 1976. Since then, far fewer animals have been observed. Knowles (1988) recorded about 200 in 1988, and in 1993, observers caught one bat and saw only three more (Grant et al. 1994). Ongoing systematic surveys by DMWR have failed to detect the presence of this species (DMWR 2006), and there is some concern that the subspecies may be extirpated in American Samoa (Grant et al. 1994; Utzurrum 2005, pers. comm.; DMWR 2006).

Distinct Population Segment(DPS):

The definition of species in section 3(15) of the Endangered Species Act (Act) includes any distinct population segment(s) of any species of vertebrate fish or wildlife that interbreed when mature. For a population to be listed under the Act as a distinct vertebrate population segment, three elements are considered: 1) the discreteness of the population segment in relation to the remainder of the species to which it belongs, 2) the significance of the population segment to the species to which it belongs, and 3) the populations segments conservation status in relation to the Acts standards for listing (i.e., is the population segment, when treated as if it were a species, endangered or threatened?) (61 FR 4722).

The available information indicates that distinct populations of the Pacific sheath-tailed bat, a cave-dwelling species whose populations are often highly localized, are definable. As expected in a species with broad geographic range and great discontinuities, the species as a whole shows strong geographic variation (Palmeirim et al. 2005). Koopman (1997) recognized four subspecies on morphological characters alone and it is possible that at least some of the subspecies will turn out to be sufficiently differentiated to be classified as distinct species (Palmeirim et al. 2005). The distinct population segment of Pacific sheath-tailed bat in American Samoa is discrete in relation to the remainder of the species as a whole. The Pacific sheath-tailed bat is known from American and Independent Samoa, Tonga, Fiji, and Vanuatu, but has shown drastic declines on the islands where it still occurs, or even to limited areas of single islands. In fact, it is believed to be extirpated from Independent Samoa (Grant et al. 1994; Koopman and Steadman 1995; Tarburton 2002) and may have never been present on Vanuatu (Flannery 1995; Koopman 1997; Palmeirim et al. 2005). The nearest possible population to the U.S. population is that of Independent Samoa, which is roughly 161 kilometers (km) (100 miles (mi)) away and believed to be extirpated (Grant et al. 1994; Koopman and Steadman 1995; Tarburton 2002). The population segment of this species in American Samoa is therefore distinct based on geographic and distributional isolation from remaining Pacific sheath-tailed bats in Independent Samoa, Tonga, Fiji, and Vanuatu.

A population segment is considered significant if its loss would constitute a significant gap in the range of the taxon. The American Samoa population of the Pacific sheath-tailed bat represents the easternmost distribution of this species. The loss of this population would truncate the species range by approximately 161 km (100 mi) and perhaps farther if the Independent Samoa population is also extirpated. Such a range reduction is significant when a species is declining range-wide, as this one is, thereby reducing the possibility

of dispersal and re-colonization from other areas. Furthermore, extremes of within-species variation in genotype, phenotype, and/or behavior are likely to occur at the periphery of species ranges (Erwin 1991); loss of the American Samoa population of the Pacific sheath-tailed bat could therefore constitute loss of important genetic or other variability within the species. The population structure of this species may be described as a metapopulation: although stochastic events may result in extirpations on some islands, they may be re-colonized by dispersers coming from other populations (Palmeirim et al. 2005). Having such a structure, the species will only survive in an archipelago if the island colonization rate is sufficiently high to compensate for the rate of extirpation. Colonization rate is clearly proportional to the availability of source populations, therefore; if the rate of extirpation on individual islands due to stochastic events is higher than the rate of colonization, the long term result may be the permanent regional extinction of the species (Palmeirim et al. 2005). Based on the discreteness and significance of the American Samoa population of the Pacific sheath-tailed bat, the U.S. Fish and Wildlife Service (FWS) considers this population to be a distinct vertebrate population segment which warrants review for listing under the Act. The American Samoa distinct population segment of the Pacific sheath-tailed bat faces severe and imminent threats. See Summary of Threats and Rationale for Listing Priority Number sections, below.

Threats

A. The present or threatened destruction, modification, or curtailment of its habitat or range:

The reasons for the decline of the sheath-tailed bat in American Samoa are unclear; however, the loss of roosting caves as a result of severe storms in American Samoa is believed to be a threat to this species (Craig et al. 1993; Grant et al. 1994). Two caves at Anapeapea Cove were reported as roosting sites for most of the bats estimated in 1976 and 1977 (Amerson et al. 1982). Severe storms, particularly Typhoons Ofa (1990) and Val (1991), removed the dense vegetation that had obscured the entrance to the larger cave at Anapeapea, inundated the cave with water, filled the cave with coral and fallen trees, and washed the cave walls clean (Grant et al. 1994). No bats were reported in either cave at Anapeapea during 1993 surveys (Grant 1993; Grant et al. 1994). Only small numbers of bats have been observed in other caves during those surveys, but there is no information on how many other caves there are, or how many bats they could support (Grant 1993; Grant et al. 1994).

In addition to the effects on the roost caves, storms are likely to have a negative impact on bats due to the deforestation (Palmeirim et al. 2005) that leads to loss of foraging habitat.

B. Overutilization for commercial, recreational, scientific, or educational purposes:

None known.

C. Disease or predation:

Rats (*Rattus* spp.) have been postulated as a problem for the Mariana Island subspecies of the Pacific sheath-tailed bat (Wiles and Worthington 2002) and are potential predators of Pacific sheath-tailed bats in American Samoa; however, the extent of this possibility is unknown. In addition, it is well known that domestic cats (*Felis catus*) can capture low flying bats, and it has been documented that they wait for bats as they emerge from caves and capture them in flight (Tuttle 1977; Ransome 1990; Woods et al. 2003). Consequently, even a few cats can have a major impact on a population of cave-dwelling bats (Palmeirim et al. 2005). Palmeirim et al. (2005) indicates that, of the predators introduced to Fiji, cats are the most likely to prey on bats. Feral cats are present on Tutuila and on Manua Islands in American Samoa (Freifeld 2007, pers. comm.). The role of these introduced predators in the decline of the Pacific sheath-tailed bat is not proven but it is strongly supported as a factor (Palmeirim et al. 2005). Likewise, the role of disease in the species decline is not known as it has not been studied; however, disease could be a factor, especially for a communally

roosting species such as the Pacific sheath-tailed bat (Wiles and Worthington 2002). While introduced pathogens are a plausible cause for the decline of this bat, there is currently no evidence for it (Palmeirim et al. 2005).

D. The inadequacy of existing regulatory mechanisms:

The inadequacy of existing regulatory mechanisms does not appear to be a threat to this species. The Pacific sheath-tailed bat has been afforded complete legal protection from take and trapping, where take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct, in American Samoa since at least 1995 (Ch. 8, Title 24 of the American Samoa Administrative Code; Tulafono 2006, pers. comm.).

E. Other natural or manmade factors affecting its continued existence:

In addition to destroying suitable roosting caves, severe storms, such as Typhoons Ofa (1990) and Val (1991), likely killed the bats that were in the Anapeapea caves directly, and both storms may have led to the deaths of additional bats due to starvation (Grant 1993; Grant et al. 1994).

Other factors that may have led to the decline of the Pacific sheath-tailed bat in American Samoa are disturbance of roost caves by humans for recreational purposes (Wiles and Worthington 2002) and, more commonly, for guano mining (Grant et al. 1994; Tarburton 2002). Roost disturbance is a well-known problem for many cave-dwelling species (Palmeirim et al. 2005). Disturbance at caves may cause bats to leave for alternate roost sites, in turn increasing their risk of predation and decreasing their roost time, the latter of which could increase stress.

Tarburton (2002) suggests that pesticides may have played an important role in the decline of bats on both American Samoa and Independent Samoa, particularly during the years in which taro was grown on large scales for export (1975-1985). However, pesticide use may not have been an important factor in bat declines on American Samoa (Utzurrum 2005, pers comm.).

The low numbers of individuals and populations of this subspecies place this bat at great risk of extinction from inbreeding and stochastic events such as storms (Wiles and Worthington 2002). The threat is significant for cave-dwelling species whose populations are often highly localized with few numbers of animals that can easily be lost in a severe storm, disease outbreak, or disturbance to the roost caves (Wiles and Worthington 2002).

Conservation Measures Planned or Implemented :

In an attempt to ascertain whether the species is still extant, American Samoas Department of Marine and Wildlife Resources completed surveys for the Pacific sheath-tailed bat in 2008 and a publication is planned by Dr. Ruth Utzurrum on the results of those surveys. No Pacific sheath-tailed bats were detected during those surveys. New surveys using different methodology are planned to begin in FY2012. These surveys will utilize passive acoustic detection systems that will be deployed to various locations on Tutuila and Manua for extended (two weeks to one month) periods of time. These systems will passively record high frequency sounds throughout the night and data will be downloaded periodically to search for call signatures of the Pacific sheath-tailed bat. Additionally a vehicle based system will automatically record high frequency noises when vehicles are driven at night. If a bat is detected, more intensive surveys will be immediately started.

Upon completion of these surveys, DMWR intends to analyze cave sediments to assist in assessing the biological merits of reintroduction should the subspecies be deemed extirpated from the Territory (Tulafono 2006, pers. comm.).

Summary of Threats :

In summary, current threats to this subspecies are its extremely small population size and limited distribution, habitat loss, and predation by introduced species. A potential threat is human disturbance to roosting caves (Grant et al. 1994; Hutson et al. 2001; Wiles and Worthington 2002). These threats indicate that the American Samoa DPS of the Pacific sheath-tailed bat continues to merit status as a candidate for listing. We find that this distinct population segment is warranted for listing throughout all of its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

For species that are being removed from candidate status:

_____ Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions(PECE)?

Recommended Conservation Measures :

- Complete surveys to determine whether the species is still extant on American Samoa
- Continue conduct studies to determine causes and extent of decline
- Protect roost caves from disturbance
- Control and remove nonnative predators in and around roost caves
- Conduct genetic analyses to determine if this subspecies warrants species status
- Develop species augmentation or reintroduction plan, as appropriate

Priority Table

Magnitude	Immediacy	Taxonomy	Priority
High	**Imminent**	Monotypic genus	1
		Species	2
		Subspecies/Population	**3**
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/Population	6
Moderate to Low	Imminent	Monotype genus	7
		Species	8
		Subspecies/Population	9
	Non-Imminent	Monotype genus	10
		Species	11
		Subspecies/Population	12

Rationale for Change in Listing Priority Number:

Magnitude:

This species is highly threatened by its small size and extremely restricted distribution, which makes it highly

susceptible to stochastic natural disturbances, such as typhoons and disease outbreaks; by loss of habitat (roosting caves and foraging habitat); and by predation from nonnative mammals. These threats occur throughout the Pacific sheath-tailed bats range on American Samoa. Human disturbance of their roosting caves is a potential threat.

Imminence :

Threats to the Pacific sheath-tailed bat are imminent because they are ongoing.

__Yes__ Have you promptly reviewed all of the information received regarding the species for the purpose of determination whether emergency listing is needed?

Emergency Listing Review

__No__ Is Emergency Listing Warranted?

The subspecies does not appear to be appropriate for emergency listing at this time because the immediacy of the threats is not so great as to imperil a significant proportion of the taxon within the timeframe of the routine listing process. The biggest threat at this time on American Samoa appears to be the vulnerability to stochastic events, such as typhoons, which cannot be addressed through the protections of listing the subspecies. If it becomes apparent that the routine listing process is insufficient to prevent significant losses that may result in this species' extinction, then the emergency rule process for this species will be initiated. We will continue to monitor the status of the Pacific sheath-tailed bat as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

Description of Monitoring:

The American Samoa DMWR is responsible for monitoring the population status of the Pacific sheath-tailed bat. This agency is funded through the FWSs Federal Assistance program for wildlife restoration on an annual basis to monitor and manage the fish and wildlife resources of American Samoa, and the FWS requests annual updates from DMWR on the status of candidate species. We also reviewed current scientific literature to seek new published information about the species in Samoa and elsewhere in its range, and we sent our most current information to regional and species experts for review. We received the latest update from DMWR on April 4, 2011; other queries and literature review yielded no new information. Surveys and monitoring of the Pacific sheath-tailed bat in other areas throughout their range have been only sporadic and mostly undescribed. However, some more recent assessments of the Pacific sheath-tailed bat indicate a decline in numbers and distribution of Pacific sheath-tailed bats throughout its range in the tropical Pacific (Hutson et al. 2001; Helgen and Flannery 2002; Tarburton 2002; Palmeirim et al. 2005).

Although no regular surveys were previously conducted for the Pacific sheath-tailed bats in American Samoa, efforts are currently being made to ascertain whether the species is still extant. Surveys were completed 2008 and a publication is planned by Dr. Ruth Utzurrum on the results of those surveys. No Pacific sheath-tailed bats were detected during those surveys. New surveys using different methodology are planned to begin in FY2012. These surveys will utilize passive acoustic detection systems that will be deployed to various locations on Tutuila and Manua for extended (two weeks to one month) periods of time. These systems will passively record high frequency sounds throughout the night and data will be downloaded periodically to search for call signatures of the Pacific sheath-tailed bat. Additionally a vehicle based system will automatically record high frequency noises when vehicles are driven at night. If a bat is detected, more intensive surveys will be immediately started.

This species is classified as endangered in the International Union for Conservation of Nature and Natural Resources (IUCN) Red Data List database (IUCN 2006), and is included in the Comprehensive Strategy for

Wildlife Conservation in American Samoa (DMWR 2006).

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment:

none

Indicate which State(s) did not provide any information or comment:

American Samoa

State Coordination:

On February 22, 2013, we sent a letter to the American Samoa Department of Marine and Wildlife Resources requesting their review and comment on our most recent candidate assessment of this species. No additional information or comments were received. We met with American Samoa biologists in November, 2013, and discussed candidate species. Therefore, we believe this assessment contains the most recent available information about the species.

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Approval/Concurrence:

Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve:  06/18/2014
Date

Concur:  11/18/2014
Date

Did not concur: _____ _____
Date

Director's Remarks: