

Williams, Secretary, Kansas Department of Wildlife and Parks, *in litt.* 1997).

Likewise, the State of New Mexico declined to enter into the MOU due to staff and fiscal constraints (Jerry A. Maracchini, Director, New Mexico Department of Game and Fish, *in litt.* 1997).

#### Public Comments Solicited

The Service solicits written comments on information described in this notice. All previous comments and information submitted in response to earlier comment periods on this proposed action will be considered. Communications received during this comment period may lead to a final regulation that differs from that presented in this notice.

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#### Author

The primary author of this notice is Ken Collins, U.S. Fish and Wildlife Service (see ADDRESSES above).

#### Authority

The authority for this action is 16 U.S.C. 1531-1544.

Dated: November 24, 1997.

**Jamie Rappaport Clark,**

*Director, Fish and Wildlife Service.*

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## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### 50 CFR Part 17

RIN 1018-AE39

#### Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for Two Cave Animals From Kauai, Hawaii

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

**SUMMARY:** The U.S. Fish and Wildlife Service (Service) proposes endangered status pursuant to the Endangered Species Act of 1973, as amended (Act), for two animals—the Kauai cave wolf spider (*Adelocosa anops*), and the Kauai cave amphipod (*Spelaorchestia koloana*). These two species are found on the Hawaiian island of Kauai. The Kauai cave wolf spider is known from two populations, and Kauai cave amphipod is known from four populations. These animals and their habitats have been variously affected or are currently threatened by the following: Habitat degradation/loss from development; competition for space, water, and nutrients by naturalized, introduced animals; biological/chemical pesticide use; and an increased likelihood of extinction from proposed development activities and naturally occurring events. This proposal, if made final, would extend Federal protection and recovery provisions of the Act for these animal taxa. Additionally, Hawaii state regulations protecting these animals as endangered species would be triggered.

**DATES:** Comments from all interested parties must be received by February 3, 1998. Public hearing requests must be received by January 20, 1998.

**ADDRESSES:** Comments and material concerning this proposal should be sent to the U.S. Fish and Wildlife Service, 300 Ala Moana Boulevard, Room 6307, P.O. Box 50167, Honolulu, Hawaii 96850. Comments and material received will be available for public inspection, by appointment, during normal business hours at the above address.

**FOR FURTHER INFORMATION CONTACT:** Robert P. Smith, Pacific Islands Ecoregion Manager, at the above address (808/541-2749).

#### SUPPLEMENTARY INFORMATION:

##### Background

The Kauai cave wolf spider (*Adelocosa anops*) and Kauai cave amphipod (*Spelaorchestia koloana*) are known only from the Hawaiian island of Kauai. The Kauai cave wolf spider is known from two populations, and Kauai cave amphipod from four populations.

The Hawaiian archipelago includes eight large volcanic islands (Niihau, Kauai, Oahu, Molokai, Lanai, Kahoolawe, Maui, and Hawaii), as well as offshore islets, shoals, and atolls set on submerged volcanic remnants at the northwest end of the chain (the Northwestern Hawaiian Islands). Each island was built sequentially from frequent, voluminous basaltic lava flows (Stearns 1985). The youngest island, Hawaii, is still volcanically active, and retains its form of coalesced, gently sloping, unweathered shield volcanoes. Vulcanism on the older islands has long since ceased, with subsequent erosion forming heavily weathered valleys with steep walls, and well-developed streams and soils (Zimmerman 1948).

In the formation of the islands, the lava flows create caves, cracks, gas pockets and smaller, interconnected subterranean spaces or mesocaverns (Howarth 1973; 1987a). While unique subterranean faunas have long been known from temperate continental cave systems, until the 1970's obligate cave inhabiting animals were thought to be absent from tropical and island systems (Howarth 1987a). In the last 3 decades, however, a remarkable assemblage of about 50 species of cave-adapted animals have been discovered in Hawaiian caves (Howarth 1972; 1987a, b). Cave adapted species have evolved directly from native surface dwelling ancestors in at least 12 groups of Hawaiian arthropods (Howarth 1991).

These obligate cave-dwellers are generally found on the younger islands where an abundance of unweathered lava flows exist (Howarth 1983c). On older islands, soil formation, erosion and siltation have filled in most subterranean voids thus eliminating the habitat for cave animals. The island of Kauai is the oldest of the eight major Hawaiian islands and was formed by a single shield volcano approximately 5.6 million years ago (Stearns 1985). Three million years of weathering eliminated most cave habitats formed during this initial vulcanism. Between 0.6 and 1.4 million years ago, the Koloa series of post-erosional lava flows again provided available habitat for subterranean animals. Subsequent erosion also filled in most of the habitat in the Koloa series

of flows with the exception of a small area along the arid, southern coast.

Because of the age of this island and the extensive erosion, it was not originally expected to harbor any cave animals. However, in 1971, two eyeless cave arthropods, a spider and amphipod, were discovered from caves in the Koloa series lava flows of Kauai. These animals are known only from a single exposed lava flow in the "very rocky" to "extremely rocky" Waikomo soil series (U.S. Department of Agriculture, Soil Conservation Service 1972). This unweathered area covers approximately 10.5 square kilometers (4 square miles), and exhibits no blanketing by erosional sediments. The amphipod also occurs in a younger limestone cave formed on top of a portion of the exposed Koloa series flow. These animals are restricted to the dark, moist areas of larger caverns and smaller subterranean spaces. The amphipod is a detritivore and feeds primarily on rotting tree roots whereas the spider is a carnivore and preys upon the amphipod and alien arthropods that venture underground.

The land supporting these two animal species is privately owned, as are areas adjacent with potentially suitable habitat.

#### Discussion of the Two Animal Taxa Included in This Proposed Rule

Frank Howarth first discovered the Kauai cave wolf spider (*Adelocosa anops*) in Koloa Cave #2 in 1971, and it was formally described by Willis Gertsch (Gertsch 1973). This species is a member of the wolf spider family (Lycosidae). Spiders in this family are characterized by a distinct eye pattern, including two particularly large eyes in the middle row. The most conspicuously diagnostic character of the Kauai cave spider is its complete lack of eyes. This character is unique among wolf spiders and its distinction justifies the recognition of a separate genus for this taxon. A few species of wolf spider have reduced eyes, including another cave-adapted species on the island of Hawaii, but only in the Kauai cave wolf spider are the eyes entirely absent. Adults of the Kauai cave wolf spider are about 12.7 to 19.0 millimeters (0.5 to 0.75 inches) in total length with a reddish-brown carapace, pale abdomen and bright orange legs. The hind margin of each chelicera (biting jaw) bears three large teeth, two situated basally, and third at the distal end of the chelicera. The tibiae of the two anterior pairs of legs have four pairs of ventral spines, and tarsi (ultimate segments) and metatarsi (penultimate

segments) of all legs bear unusually long and silky trichobothria (sensory hairs).

The Kauai cave wolf spider is a predator, and although blind, can detect the presence of potential food items and actively stalks its prey (Howarth 1983a). Although predation has not been observed in the field, the spider probably feeds primarily on the Kauai cave amphipod, and to a lesser extent on alien species of arthropods that periodically enter the cave system. Compared to most wolf spiders, the reproductive capacity of the Kauai cave wolf spider is extremely low, with only 15 to 30 eggs laid per clutch (Howarth 1981; Wells *et al.* 1983). Newly hatched spiderlings are unusually large, and carried on the back of the female for only a few days (Howarth 1991; Howarth and Mull 1992).

The Kauai cave wolf spider has been found only in two lava tube systems in the Koloa area of Kauai; specifically the Koloa Caves and Kiahuna Caves (Gertsch 1973; Frank Howarth, Bishop Museum, *in litt.* 1979). The spider is restricted to the dark zones of the caves and adjoining fissures. Similar to other Hawaiian cave-adapted spiders, this species is highly susceptible to desiccation (Hadley *et al.* 1981; Ahearn and Howarth 1982). The spider is active in the large caverns only during wetter times of the year (Howarth, *in litt.* 1979) or smaller areas that maintain a saturated atmosphere (Howarth 1981). Because of the seasonal and spatial movement of the spider in and out of areas accessible to biologists, survey methods have not been developed to obtain accurate population estimates.

Frank Howarth also discovered the Kauai cave amphipod (*Speleorchestia koloana*) along with the Kauai cave wolf spider in Koloa Cave #2 in 1971. Because of the unusual attributes of a highly reduced pincher-like condition of the first gnathopod (cephalothoracic appendage) and the second gnathopod being mitten-like in both sexes, this taxon is placed in its own unique genus (*Speleorchestia*) within the family Talitridae (Bousfield and Howarth 1976). This species is also distinctive in its lack of eye facets and pigment, and extremely elongate, spiny, postcephalic appendages. Adult amphipods are 7 to 10 millimeters (0.25 to 0.4 inches) in length and very slender-bodied, with a hyaline cuticle. Gnathopod 1 is highly reduced and gnathopod 2 is mitten-like. Antenna 2 is slender and elongate, with the flagellum only slightly longer than the peduncle. Peraeopods (abdominal walking legs) are very elongate, with slender, attenuated claws. All pleopods (swimming legs) are reduced, with branches vestigial or lacking. Uropods

(tail-like appendages) 1 and 2 have well developed prepeduncles, and brood plates in the mature female are vestigial or entirely absent.

The Kauai cave amphipod is a detritivore and has been observed feeding on rotting roots of *Pithecellobium dulce* (Manila tamarind) and *Ficus* sp. (fig), rotting sticks, branches and other plant material washed into the caves, and arthropod fecal material. In large cave passages, most individuals are found on or underneath roots or rotting debris. However, this amphipod does not appear to be particularly gregarious. When disturbed, this species typically moves slowly away rather than jumping like other amphipods. Nothing is known of the reproductive biology of this amphipod, but the vestigial brood plates of the female suggest they give birth to a small brood of large offspring (Bousfield and Howarth 1976; Poulson and White 1969).

While found in the same caves in the Koloa lava flow series as the Kauai cave wolf spider, the cave amphipod is also known from a short lava tube (cave #210) located 1 kilometer (0.6 miles) inland of the seaward Kiahuna Cave, and the Limestone Quarry Cave 7 kilometers (4.5 miles) to the east at Mahaulepu. The latter cave occurs in a calcareous sandstone hill formed from a cemented sand-dune that was deposited on top of a disjunct exposure of the Koloa lava formation during a higher stand of the sea (Stearns 1985). The limestone cave was formed by water erosion from the ocean and a still-active fresh water stream that runs through the lowest cave level. The amphipod probably colonized this cave by migrating from the underlying Koloa lava formation. No attempt has been made to estimate the population sizes of the cave amphipod.

The two cave animals are restricted to dark, moist areas of larger caverns and smaller subterranean spaces or mesocaverns (Howarth 1983a). As with the subterranean animals on younger Hawaiian islands (Howarth 1991), the small mesocaverns may be the primary habitat for these species. For example, the Kauai cave amphipod was not seen during initial surveys of Kiahuna cave #210 (Miura and Howarth 1978). On a subsequent survey however, the floor of a small, dead end passage was saturated with 40 liters (10 gallons) of water, and 24 hours later amphipods had moved into this area, presumably from the surrounding mesocaverns (Howarth, *in litt.* 1979; Howarth 1983a). On younger islands, these mesocaverns also allow animals to move among larger, adjacent lava tubes (Howarth 1991). However,

because these smaller voids become filled with erosional sediment in older flows like Koloa and as a result of surface disturbance (Hammatt *et al.* 1988; A. Asquith, U.S. Fish and Wildlife Service, Pacific Islands Ecoregion, *in litt.* 1994), it is unlikely that the Kauai cave animals can move among separate lava tube systems. Because distinct species can evolve in adjacent lava tubes even when cave animals can move extensively through mesocaverns (Hoch and Howarth 1993), it is prudent to consider the separate localities of these animals as different populations, even though intervening areas of potential habitat cannot be surveyed. Thus, the Koloa Caves #1 and #2 and adjacent areas are considered to harbor one population of the spider and one population of the amphipod. The seaward Kiahuna Caves #267 and #276 harbor another population of both the spider and amphipod. Kiahuna Cave #210 and the Limestone Quarry Cave each harbor populations of the cave amphipod.

The restricted area in which these animals occur is rapidly undergoing development. The shallow cave habitat is degraded or destroyed through surface alterations such as grading, blasting, paving, and placement of fill. These animals are also increasingly under risk from pesticide use and pollution associated with residential and golf course development.

#### Previous Federal Action

On June 16, 1978, the Service published in the **Federal Register** (43 FR 26084) a proposal to list the Kauai cave wolf spider as an endangered species and the Kauai cave amphipod as threatened. That proposal was withdrawn on September 2, 1980 (45 FR 58171) as a result of a provision in the 1978 Amendments to the Endangered Species Act of 1973 that required withdrawal of all pending proposals that were not made final within 2 years of proposal or within 1 year after passage of the Amendments, whichever period was longer. An initial comprehensive notice of review for invertebrate animals was published on May 22, 1984 (49 FR 21664), in which the Kauai cave wolf spider and Kauai cave amphipod were treated as category 2 candidates for Federal listing. Category 2 taxa were those for which conclusive data on biological vulnerability and threats were not currently available to support proposed rules. The Service published an updated notice of review for animals on January 6, 1989 (54 FR 554). In this notice the Kauai cave wolf spider and Kauai cave amphipod were treated as category 1

candidates for Federal listing. Category 1 taxa were those for which the Service had on file substantial information on biological vulnerability and threats to support preparation of listing proposals. In the notice of review for all animal taxa published by the Service on November 21, 1991 (58 FR 58804), the two Kauai cave arthropods were again listed as category 2 candidates. In the November 15, 1994, notice of review for all animal taxa (59 FR 58982), the two Kauai cave arthropods were elevated to category 1 candidates. Upon publication of the February 28, 1996, notice of review (61 FR 7596), the Service ceased using category designations and included the two cave arthropods as candidate species. Candidate species are those which the Service has on file sufficient information on biological vulnerability and threats to support proposals to list the species as threatened or endangered.

The processing of this proposed rule conforms with the Service's final listing priority guidance published in the **Federal Register** on December 6, 1996 (61 FR 64475). The guidance clarifies the order in which the Service will process rulemakings during fiscal year 1997. The guidance calls for giving highest priority (Tier 1) to handling emergency situations, second highest priority (Tier 2) to resolving the listing status of the outstanding proposed listings, and third priority (Tier 3) to new proposals to add species to the list of threatened and endangered plants and animals. This proposed rule constitutes a Tier 3 action.

#### Summary of Factors Affecting These Species

Procedures found in section 4 of the Endangered Species Act (16 U.S.C. 1533) and regulations (50 CFR part 424) promulgated to implement the Act set forth the procedures for adding species to the Federal lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the Kauai cave wolf spider (*Adelocosa anops*) and the Kauai cave amphipod (*Spelaeorchestia koloana*) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* These animals are restricted to a 10.5 square kilometers (4 square miles) coastal section of the Koloa series lava flows that have not been filled with erosional sediment. Surface modifications in this area directly impact the subterranean habitat that supports the spider and amphipod

(Hammatt *et al.* 1988; Miller and Burgett 1995; Asquith, *in litt.* 1994). Prior to arrival of Polynesians in Hawaii the above ground habitat of this area was probably comprised of a coastal dry shrubland and would have included plants such as *Sida fallax* ('ilima), *Myoporum sandwicense* (naio), *Chamaesyce celastroides* ('akoko) and *Santalum ellipticum* ('iliahialo'e) (Gagne and Cuddihy 1990). On the islands of Maui and Hawaii, these plants are known to produce extensive root systems into underlying lava tube fissures (F. Howarth, Bishop Museum, pers. comm. 1994), and probably also formed the primary nutrient source for the cave ecosystem at Koloa.

The first thousand years of Polynesian habitation in Hawaii would have had little significant impact on the cave system at Koloa. With a rapid population increase after 1400 A.D. however, the expansion of agriculture from more favorable, mesic valleys and the use of fire to clear plant communities probably led to heavy modification of most leeward areas of the Hawaiian Islands (Kirch 1982; Cuddihy and Stone 1990). A perennial stream flowing directly through the Koloa area allowed Polynesians to develop extensive irrigated fields of *Colocasia esculenta* (taro), *Ipomoea batatas* (sweet potato) and *Saccharum officinarum* (sugar cane), as well as dry land cultivation of sweet potato (Handy and Handy 1972; Hammatt and Tomonari 1978; Hammatt *et al.* 1988; Sinoto 1975).

Field irrigation of traditional crops continued in the Koloa area until 1835 when the first sugar plantation in the Hawaiian Islands was established at Koloa. Thereafter most of the land with suitable top soil was used for large-scale sugar cane cultivation (Hammatt *et al.* 1988). This activity included the mechanical clearing of stones and boulders, and consolidation of smaller field plots. The surface modifications associated with these past agricultural activities would have greatly reduced underground root biomass through the destruction of perennial vegetation (Howarth 1981; Miller and Burgett 1995), and also increased sediment deposition in subterranean fissures (Hammatt *et al.* 1988; Asquith, *in litt.* 1994).

Thus, with the exception of a narrow 0.5 kilometer-wide (0.25 mile-wide) strip of particularly rocky land immediately along the coast, most of the potential habitat for both the spider and the amphipod was heavily modified prior to the 1950's. On interior lands, small areas of exposed pahoehoe lava, rock outcrops and the entrances to lava

tubes were generally unsuited for cultivation of crops and were left less disturbed. In areas improved for pasture use, however, some cave entrances also were filled or covered (Hammatt *et al.* 1988; Howarth, *in litt.* 1977). The remaining pockets of uncultivated land around collapsed lava tubes and exposed lava probably served as refugia for the cave animals. Significantly, all the known populations of both the spider and amphipod are in areas never used for plantation sugar cane cultivation.

In the last 5 decades, the Koloa area has changed from an agriculture-based economy to one increasingly dependent on tourism (Kauai Office of Economic Development, *in litt.* 1994). Approximately 75 percent of the original habitat available for the cave animals is now designated as "urban" or "urban residential" (County of Kauai, *in litt.* 1994), and the population of the Koloa area is expected to double by the year 2015 (KPMG 1993). This population growth has led to rapid growth in the number of homes, condominiums, and resort hotels originally centered along the coastal strip. In recent years, interior lands supporting both populations of the spider and all but one population of the amphipod have been rezoned from agriculture to urban usage and are undergoing development. With the construction of roads, residences, and golf courses, the subterranean habitat is degraded through the removal of perennial vegetation and its root systems, the collapse of lava tubes from heavy construction equipment, and increased siltation from grading and filling activities associated with landscaping and construction (Hammatt *et al.* 1988; Asquith, *in litt.* 1994). The population of the Kauai cave wolf spider in Koloa Cave #2 is directly threatened by a proposed bypass road that could destroy the most important section of the cave. The disjunct population of the amphipod in the limestone cave is threatened from a quarrying operation occurring directly above and adjacent to the cave system (Howarth, *in litt.* 1977, 1978; 43 FR 26084). Thus, most of the land that potentially harbored these animals has been highly modified and an estimated 75 percent of the area has probably been rendered uninhabitable. The remaining habitat, harboring virtually all known populations of the spider and amphipod, is being degraded by current land use or threatened with degradation by proposed development.

**B. Overutilization for commercial, recreational, scientific, or educational purposes.** Overutilization is not known

to be a factor, but unrestricted collecting for scientific purposes or excessive visits by individuals interested in exploring the lava tubes could result from increased publicity and would seriously impact both of the cave species (Howarth 1982; Culver 1992). Such disturbances by human visitation could also promote greater invasion by alien arthropod species.

**C. Disease and predation.** Several alien spiders including the brown violin spider (*Loxosceles rufescens*), *Dysdera crocata* (NCN) and the spitting spider (*Scytodes longipes*) have invaded the cave habitats in Koloa (Gerstch 1973; F. Howarth, pers. comm. 1994; Asquith, *in litt.* 1994), and prey on immature stages of the Kauai cave wolf spider and probably all life stages of the cave amphipod (Howarth 1981). The American cockroach (*Periplaneta americana*) is abundant in some of the caves (Bousfield and Howarth 1976; Asquith, *in litt.* 1994) and probably opportunistically preys on immature cave amphipods (F. Howarth, pers. comm. 1994) and competes for space at amphipod food sources (Asquith, *in litt.* 1994). In the Limestone Quarry Cave, the introduced amphipod *Talitroides topitotum* (NCN) may compete with the Kauai cave amphipod for detritus food (Bousfield and Howarth 1976; F. Howarth, pers. comm. 1994).

In addition, as noted in the Background section, the Kauai cave wolf spider is a predator. Although predation has not been observed in the field, this spider probably feeds primarily on the Kauai cave amphipod, and to a lesser extent on alien species of arthropods that periodically enter the cave system.

**D. The inadequacy of existing regulatory mechanisms.** The Kauai cave wolf spider and the Kauai cave amphipod are found entirely on private land. One population of the cave spider is provided some protection by a County ordinance requiring the landowner to conserve two Kiahuna lava tubes known to harbor the spider (County of Kauai Development Plan 1979). However, existing conservation measures under this ordinance protect only the cave entrances and not the surface footprint or adjacent mesocaverns which the animals require for habitat. Evaluation of one of the caves conserved under this ordinance showed significant degradation from surface disturbance over the dark zone (Asquith, *in litt.* 1994). In addition, this ordinance protects only a single population of each of the cave animals, which is not sufficient to ensure the continued existence of these species because all other populations are threatened and even the Kiahuna caves populations are

susceptible to accidental events such as chemical spills.

There are no State laws or existing regulatory mechanisms at the present time to protect or prevent further decline of these animals. However, Federal listing would automatically invoke listing under Hawaii State law. Hawaii's Endangered Species Act (HRS, Sect. 195D-4(a)) states, "Any species of aquatic life, wildlife, or land plant that has been determined to be an endangered species pursuant to the [Federal] Endangered Species Act shall be deemed to be an endangered species under the provisions of this chapter and any indigenous species of aquatic life, wildlife, or land plant that has been determined to be a threatened species pursuant to the [Federal] Endangered Species Act shall be deemed to be a threatened species under the provisions of this chapter." Listing of these two arthropod species will therefore also invoke protection available under State law (see Available Conservation Measures).

**E. Other natural or manmade factors affecting its continued existence.** Insecticide use, coincident with the change to urban land development, poses a serious threat to the cave animals (Howarth and Stone 1993). While plantation-scale sugar cane cultivation in the Koloa area involves seasonal use of herbicides, intensive usage is generally limited to spot applications of glyphosate (Roundup), and generally no insecticides are used (Murdoch and Green 1989). Furthermore, in recent years most sugar cane cultivation in the area has been restricted to land with deep soil, which is generally unsuitable habitat for the cave animals.

Golf courses exist or are proposed for the land directly above or adjacent to both populations of the spider and all but one population of the amphipod. At least 30 different pesticides are used on golf courses in Hawaii, including insecticides to control pests of turf grass (Murdoch and Mitchell 1975; Murdoch and Green 1989). Most golf courses in Hawaii apply the insecticide Chlorpyrifos at the rate of 1 pound active ingredients per acre, one to three times per year, but rates and frequency of applications are sometimes much higher (Murdoch and Green 1989; Brennan *et al.* 1992). Predators such as the Kauai cave wolf spider are generally more susceptible to insecticides than the target pests (Croft 1990). Even if not killed outright, the sublethal effects of both insecticides and herbicides on the cave animals could include reduced fecundity, reduced life span, slowed development rate, and impaired

mobility and feeding efficiency (Messing and Croft 1990).

In addition to the use of pesticides on golf courses, pesticide usage on residential property also poses a threat. It is estimated that residential lots use more pesticides per unit area than either sugar cane cultivation or golf courses, and that 90 percent of this use involves insecticides. Much of this insecticide is applied directly to the ground for termite control (Hawaii Office of State Planning 1992). With an estimated increase of 4,000 houses in the Koloa area by the year 2015 (KPMG 1993), residential pesticides are considered a serious threat to the cave animals.

These cave animals are particularly susceptible to pesticides because of their tendency to seek water sources (Howarth 1983a; Asquith, *in litt.* 1994). Even if pesticides are not used directly above a lava tube, pesticides that leach into adjacent subterranean caverns with water from runoff or irrigation are serious threats because the animals may be attracted to the water and come into contact with the chemicals.

Biological control agents (living organisms used to control pests) are usually perceived as preferable to the use of chemicals because they represent less of a threat to human health and generally do not stimulate resistance in pests. Some of these organisms, however, attack species other than their intended targets and have caused or contributed to the decline and extinction of several Hawaiian insects (Gagne and Howarth 1985; Howarth 1983b; Howarth 1991). The nematode *Steinernema carpocapsae* (NCN) is marketed for use against turf pests and has been petitioned for use on golf courses in Hawaii (Faust 1992). This nematode can infect at least 250 species of arthropods (Poinar 1979) including arachnids such as the Kauai cave wolf spider (Poinar and Thomas 1985). Biological control has been emphasized for golf course management in the Koloa area (Townscape 1993) and is a potential threat to the cave spider and amphipod.

The small number of populations of the Kauai cave wolf spider (two populations) and Kauai cave amphipod (four populations) increases the risk of extinction from naturally occurring events such as storms or earthquakes.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these species in proposing this rule. Based on this evaluation, the preferred action is to list the Kauai cave wolf spider and Kauai cave amphipod as endangered. These two species are

threatened by one or more of the following: Habitat degradation and/or predation by alien arthropods; competition for space and nutrients with alien arthropods; habitat loss from agriculture, residential and resort development, and quarrying activities; human impacts from pesticide use and biological pest control. In addition, the small number of populations and limited distribution make these species particularly vulnerable to extinction from accidental or naturally occurring events. Because the two species are in danger of extinction throughout all or a significant portion of their ranges, they fit the definition of endangered as defined in the Act. Therefore, listing both these species as endangered is proposed.

Critical habitat is not being proposed for the two species included in this rule, for reasons discussed in the "Critical Habitat" section of this rule.

#### Critical Habitat

Critical habitat is defined in section 3 of the Act as: (i) The specific area within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection and; (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures needed to bring the species to the point at which listing under the Act is no longer necessary.

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time a species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not prudent for the Kauai cave species. Service regulations (50 CFR 424.12(a)) state that designation of critical habitat is not prudent when one or both of the following situations exist—(1) the species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species.

The Service believes critical habitat is not prudent for the Kauai cave wolf spider and the Kauai cave amphipod

because both of the above described situations exist. The entrances to the lava tube caves that provide habitat for these two species are at ground level appearing as holes on the surface, and normally would likely be overlooked by the casual observer. However, these caves are fragile ecosystems and the publishing of a critical habitat map, as required, would attract attention to the area, and could promote vandalism and cause habitat destruction through increased human activity. The same location information would have to be actively sought through additional inquiries if based only on the listing notices.

Many specialized cave species are exceedingly vulnerable to direct human disturbance (Howarth 1983) and human visitation to caves is a widespread problem (Culver 1992). Even if the human activity does not have harmful intent, it would likely result in increased foot traffic, introduction of foreign material, heat and drying from bodies and lamps, and destruction of tree roots and other cave animal food sources all of which would be detrimental to these species (Miura and Howarth 1978). The Kauai cave wolf spider completely lacks eyes and is restricted to dark zones of the caves and adjoining fissures. The spider is active only during wetter times of the year or in smaller cave areas that exhibit saturated atmosphere. This lack of sight and specific life requirement needs make the cave spider especially vulnerable to human intrusion from trampling, casual collection, and modifying the cave environment through changes in air circulation and humidity. The Kauai cave amphipod is generally associated with rotting sticks, branches and miscellaneous plant material, as well as other decomposing organic debris. When disturbed, this species typically moves slowly away rather than jumping like other amphipods. This behavioral pattern and the association with debris occurring on the cave floor make this species especially vulnerable to human activity such as foot traffic. Moreover, since the amphipod is thought to be an important food source for the Kauai cave wolf spider, adverse impacts to the amphipod could also affect the cave spider. For these reasons, the risks posed by human activity to these species that could result from publication of critical habitat maps is significant.

In addition, designation of critical habitat would not be beneficial to these species. Critical habitat designation provides protection only on Federal lands or on private lands when there is

Federal involvement through authorization or funding of, or participation in, a project or activity. The two Kauai cave animals are known to occur only on private land and there presently is no Federal nexus through permitting or funding activities. Therefore, designation would provide no benefit at the present time.

However, even if Federal involvement through permitting or funding occurs sometime in the future, critical habitat would not provide any added conservation benefit to these species. Section 7(a)(2) of the Act requires Federal agencies, in consultation with the Service, to ensure that any action authorized, funded or carried out by such agency, does not jeopardize the continued existence of a federally-listed species. The consequence of critical habitat designation is that Federal agencies must also ensure that their actions do not result in destruction or adverse modification of critical habitat. However, the prohibition on adverse modification would provide no benefit beyond that provided by the prohibition on jeopardy. The Kauai cave wolf spider has been found in only two lava tube systems and the Kauai cave amphipod in the same two systems and two other caves. If designated for these species, critical habitat would likely involve only occupied habitat because of the specific and unique life requirements of the two cave animals. Thus, because of these few locations of limited size, any activity that would adversely modify critical habitat would likely jeopardize the continued existence of the species as well. The designation of critical habitat would, therefore, afford no additional benefit.

In addition, in some cases, critical habitat may provide some benefits to a species by identifying areas important to a species conservation. However, in this case, this information can be disseminated through alternative means. All involved parties and landowners have been notified of the importance of the cave species habitat. The Service is also working with these landowners through the Partners for Wildlife program to fence the cave entrances to discourage human intrusion. Appropriate consultation and coordination with other Federal agencies, such as the Federal Highway Administration and the Department of Agriculture, will occur once the specific federally-supported activity that could affect the two cave species is proposed.

In summary, there would be substantial risks to these species by publicizing maps of the locations of their cave habitats. Weighed against the fact that there would be no additional

benefit to the species, the Service finds that designation of critical habitat for the two cave animals is not prudent at this time.

#### Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain activities. Recognition through listing results in public awareness and conservation actions by Federal, State, and private agencies, groups, and individuals. The Act provides for possible land acquisition and cooperation with the State and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against certain activities involving listed animals are discussed, in part, below.

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to insure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

All known populations of the Kauai cave wolf spider and the Kauai cave amphipod are located on private property. Federally supported activities that could affect these taxa and their habitat in the future include, but are not limited to, the following—construction of roads and highways; construction of public or private facilities; construction of diversions for flood control; and the release of biological control agents.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. The prohibitions, codified at 50 CFR 17.21, in part, make it illegal for any person subject to the jurisdiction of the United

States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, or collect; or attempt any of these); import or export; transport in interstate or foreign commerce in the course of a commercial activity; or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in the course of otherwise lawful activities.

It is the policy of the Service, published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed those activities that would or would not constitute a violation of section 9 of the Act. The intent of the policy is to increase public awareness of the effect of this listing on proposed and ongoing activities within the species' range. The Service believes that, based on the best available information, the following actions will not result in a violation of section 9:

- (1) Possession, delivery, or movement, including interstate transport, involving no commercial activity, of dead specimens of these taxa that were collected prior to the publication in the **Federal Register** of the final regulation adding these taxa to the list of endangered species; and

- (2) Landscaping that does not include filling or grading the area above or adjacent to the surface footprint of the caves.

Potential activities involving these taxa that the Service believes will likely be considered a violation of section 9 include, but are not limited to, the following:

- (1) Collection of specimens of these taxa for private possession or deposition in an institutional collection;

- (2) The use of chemical insecticides that results in killing or injuring these taxa;

- (3) The unauthorized release of biological control agents that attack any life stage of these taxa; and

- (4) Habitat modification that results in actually killing or injuring these taxa by significantly impairing essential life sustaining requirements such as breeding, feeding and shelter. Such

habitat modification may include but may not be limited to: Removal or destruction of perennial vegetation within or adjacent to the surface footprint of the caves; construction, clearing, grading, digging, or filling within or adjacent to the surface footprint of the caves; blasting for construction in proximity to the caves; and alteration of the natural drainage of surface and subsurface water flow into the caves.

Federal listing will automatically invoke listing under the State's endangered species act. Hawaii's endangered species act states, "Any species of aquatic life, wildlife, or land plant that has been determined to be an endangered species pursuant to the Federal Endangered Species Act shall be deemed to be an endangered species under the provisions of this chapter..." (HRS, Sect. 195D-4(a)). Therefore, Federal listing will accord the species listed status under Hawaii State law. State regulations prohibit the removal, destruction, or damage of animals found on State lands. However, the regulations are difficult to enforce because of limited personnel. Further, the State may enter into agreements with Federal agencies to administer and manage any area required for conservation, management, enhancement, or protection of endangered species (HRS, Sect. 195D-5(c)), cutting, collecting, uprooting, destroying, injuring, or possessing any listed species of plant on State or private land, or attempting to engage in any such conduct. The State law encourages conservation of such species by State agencies and triggers other State regulations to protect the species (HRS, Sect. 195AD-4 and 5).

Questions regarding specific activities should be directed to the Ecosystem Manager of the Service's Pacific Islands Office (see ADDRESSES section). Requests for copies of the regulations concerning listed animals and inquiries regarding prohibitions and permits may be addressed to the U.S. Fish and Wildlife Service, Endangered Species Permits, 911 N.C. 11th Avenue, Portland, Oregon, 97232-4181 (503/231-6241; FAX 503/231-6243).

### Public Comments Solicited

The Service intends that any final action resulting from this proposal will be based on the best and most accurate information possible. Therefore, comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule are hereby solicited. Comments particularly are sought concerning:

- (1) Biological, commercial trade, or other relevant data concerning threat (or lack thereof) to these species;
- (2) The location of any additional populations of these species and the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;
- (3) Additional information concerning the range, distribution, and population size of these species;
- (4) Current or planned activities in the subject area and their possible impacts on these species; and
- (5) Additional information regarding whether or not designating critical habitat would be prudent.

The final decision on this proposal will take into consideration the comments and any additional information received by the Service, and such communications may lead to a final determination that differs from this proposal.

The Endangered Species Act provides for at least one public hearing on this proposal, if requested. Hearing requests must be received within 45 days of the date of publication of the proposal in the **Federal Register**. Such requests must be made in writing and addressed to the Ecoregion Manager (see ADDRESSES section).

### National Environmental Policy Act

The Fish and Wildlife Service has determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the

Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

### Required Determinations

The Service has examined this regulation under the Paperwork Reduction Act of 1995 and found it to contain no information collection requirements.

### References Cited

A complete list of all references cited herein is available upon request from the Pacific Islands Ecoregion (see ADDRESSES above).

*Author:* The author of this proposed rule is Dr. Adam Asquith, Ecological Services, Pacific Islands Ecoregion, U.S. Fish and Wildlife Service, 300 Ala Moana Boulevard, Room 6307, P.O. Box 50167, Honolulu, Hawaii 96850 (808/541-3441).

### List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and record keeping requirements, Transportation.

### Proposed Regulation Promulgation

Accordingly, part 17, subchapter B of Chapter I, Title 50 of the Code of Federal Regulations, is proposed to be amended 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; Pub. L. 99-625, 100 Stat. 3500; unless otherwise noted.

2. Section § 17.11(h) is amended by adding the following, in alphabetical order under the families indicated, to the List of Endangered and Threatened Wildlife:

#### § 17.11 Endangered and threatened wildlife.

\* \* \* \* \*

(h) \* \* \*

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*		*
ARACHNIDS							
*	*	*	*	*	*		*
Spider, Kauai cave wolf	<i>Adelocosa anops</i> .....	U.S.A. (HI) .....		NA E		NA	NA



Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*		*
CRUSTACEANS							
*	*	*	*	*	*		*
Amphipod, Kauai cave	<i>Spelaeorchestia koloana</i> .	U.S.A. (HI) .....	NA	E	.....	.....	.....
*	*	*	*	*	*		*

Dated: November 3, 1997.

**John G. Rogers,**

*Acting Director, Fish and Wildlife Service.*

[FR Doc. 97-31839 Filed 12-4-97; 8:45 am]

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## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

#### 50 CFR Part 23

#### Listing of all Sturgeon and Paddlefish Species and Their Products in the Appendices to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and its Implementation by the United States; Public Meetings

**AGENCY:** U.S. Fish and Wildlife Service, Interior.

**ACTION:** Notice of public meetings.

**SUMMARY:** With this notice the U.S. Fish and Wildlife Service (Service) announces 2 public meetings to discuss the implementation of the listing of all sturgeon and paddlefish, and their products in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). This listing decision was reached at the Tenth Conference of the CITES Parties (COP10) which was held in June of 1997. The listing becomes effective April 1, 1998. With the listing of all sturgeon and paddlefish species in CITES, this fishery product is now covered by the Service's regulations regarding import or export of wildlife. The focus of the meeting will be on aspects of importation of caviar and other sturgeon products into the United States.

**DATES:** A public meeting in New York City, NY will be held on January 17, 1998, from 8:00 am-12:00 noon, and a public meeting in Los Angeles, CA will be held on January 27, 1998, from 8:00 am-12:00 noon.

**ADDRESSES:** The public meeting in New York City will be held at St. John's

University, Bent Hall Seminar Room, 8000 Utopia Parkway, Jamaica, NY 11439. The public meeting in Los Angeles will be held at The Westin (Los Angeles Airport) Hotel, 5400 West Century Boulevard, Los Angeles, CA 90045. Please note that the rooms for these meetings are accessible to the handicapped.

**FOR FURTHER INFORMATION CONTACT:** Dr. Rosemarie Gnam, Office of Management Authority, U.S. Fish and Wildlife Service, telephone (703) 358-2095, fax (703) 358-2298.

#### SUPPLEMENTARY INFORMATION:

##### Background

The Convention on International Trade in Endangered Species of Wild Fauna and Flora, hereinafter referred to as CITES or the Convention, is an international treaty designed to control international trade in certain animal and plant species which are or may become threatened with extinction, and are listed in Appendices to the Convention. Currently, 143 countries, including the United States, are CITES Parties.

The Service is the lead agency for the implementation of CITES. As such, we are responsible for implementing recent decisions from the Tenth Conference of the Parties (COP10) which was held this past June in Zimbabwe. Among the decisions made at COP10, was to include all unlisted species of sturgeon and paddlefish in Appendix II of CITES. This listing becomes effective April 1, 1998 (see 62 FR 44627).

The order, Acipenseriformes, are a primitive group of approximately 27 species of fish, whose biological attributes make them vulnerable to intensive fishing pressure or other agents of elevated adult mortality. Although females produce large quantities of eggs, juvenile mortality is high; sturgeons are generally long-lived and slow to mature (reaching sexual maturity at 6-25 years); and depend on large rivers to spawn. Sturgeons are fished for meat and caviar, with caviar being the most valuable product and in

highest demand in international trade. Many species of sturgeons, the primary source of commercial caviar, have experienced severe population declines worldwide because of both habitat destruction and excessive take for international trade. Some are at serious risk of extinction.

Sturgeons of the Caspian Sea produce what is claimed to be the highest quality caviar and are the source of more than 90% of the world caviar trade. Russia, Kazakhstan, Azerbaijan, Turkmenistan, and Iran now supply most of the caviar from the Caspian Sea. Since the mid-1970's very marked declines in the populations of all six of the Caspian Sea's sturgeon species have been noted, especially Beluga (*Huso huso*), Russian (*Acipenser gueldenstaedtii*), and stellate (*A. stellatus*) sturgeons. Five of the six species of Caspian Sea sturgeons are considered endangered by IUCN (the World Conservation Union). The problem has become exacerbated in recent years due to deteriorating fishery management and enforcement capabilities in the region, resulting in significant levels of poaching and illegal trade. The total present take is believed to far exceed sustainable levels.

In an effort to curtail the trade in illegally obtained [poached] caviar, and to ensure sustainable use and management of wild sturgeon, particularly those of the Caspian Sea, sturgeon were considered for listing in CITES. These concerns led to the development of the CITES listing proposal by Germany to include all presently unlisted species of sturgeons in Appendix II. CITES could provide a regulatory mechanism for import and export that could curtail the illegal caviar trade and reduce threat to the wild populations. The United States, both as a sturgeon range state and major importer of Caspian Sea caviar, agreed to co-sponsor the CITES listing proposal with Germany.

At COP10 held in Zimbabwe, this past June, the proposal to include all unlisted sturgeon species in CITES was adopted by consensus. Prior to COP10,