

CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Calliasmata pholidota*

COMMON NAME: Anchialine pool shrimp

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: February 2003

STATUS/ACTION (Check all that apply):

New candidate

Continuing candidate

Non-petitioned

Petitioned - Date petition received: ____

90-day positive - FR date: ____

12-month warranted but precluded - FR date: ____

Listing priority change

Former LP: __

New LP: ____

Latest date species first became a Candidate: October 25, 1999

Candidate removal: Former LP: ____ (Check only one reason)

A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

F - Range is no longer a U.S. territory.

M - Taxon mistakenly included in past notice of review.

N - Taxon may not meet the Act's definition of "species."

X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Animal; Crustacea, Alpheidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Within the U.S., *Calliasmata pholidota* occurs on the Hawaiian Islands of Maui and Hawaii. This species has also been reported from Funafuti Atoll, Tuvalu (Ellis Islands); and, the Sinai Peninsula, Saudi Arabia.

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, Tuvalu, Saudi Arabia.

LEAD REGION CONTACT (Name, phone number): Scott McCarthy (503/231-6131)

LEAD FIELD OFFICE CONTACT (Office, name, phone number): Pacific Islands Office, Mike Richardson (808/541-3441)

BIOLOGICAL INFORMATION:

Calliasmata pholidota (Holthuis 1973) is reported from 15 millimeters (mm) (0.60 inches (in.)) to just over 30 mm (1.18 in.) in total length. Typically, the body color is pale pink to brilliant red (with red banding); legs are red to pale. There is frequently a traverse red band along the base of the telson (tail). Shrimps can change the intensity of the red pigment. Black pigments are associated with the eyes. Chelapeds (claws) are conspicuous. Locomotion is accomplished by walking over the substrate. Observations suggest that *C. pholidota* are opportunistic, taking live prey or scavenging (Maciolek in Holthuis 1973).

Within the Hawaiian Islands, *Calliasamata pholidota* is known to occur in mid- to high-salinity (19-30 parts per thousandth (ppt)) anchialine pools. Anchialine pools are land-locked bodies of water that occur coastally but are not openly connected to the ocean (Maciolek 1983). They are mixohaline, with salinities typically ranging from 2 ppt to concentrations just below that of sea water (32 ppt), although there are pools recorded as having salinities as high as 41 ppt (Maciolek 1983). Anchialine pools are subject to tidal fluctuations. Except for some records of endemic eels, anchialine pools in Hawaii do not support native species of fish although some species of alien fish have been introduced and are currently recognized as problems (see below).

Anchialine pools are very limited in number and the total area occupied by them globally is extremely small. While a number of species of anchialine shrimp (e.g., *Anticardina lauensis*, *Calliasmata pholidota*) have disjunct, global distributions within these habitats, most geographic locations contain some endemic taxa. In the state of Hawaii, there are estimated to be over 650 anchialine pools, with an estimated 90 percent of these occurring on the island of Hawaii. Unfortunately, approximately 90 percent of the pools on that island have been destroyed or otherwise impacted by development or other human uses (Richard Brock, Univ. of Hawaii, pers. comm., 1998).

Calliasmata pholidota has a disjunct, Indo-Pacific distribution, as it has been reported from a single location (pool) on the Sinai Peninsula, a single location on Funafuti Atoll (Tuvalu Islands), and two locations in the Hawaiian Islands, Hawaii (a single pool) and Maui (6 pools). In Hawaii, *Calliasmata pholidota* has never been found to be abundant. Maciolek (in Holthuis 1973) states that the total population number of *C. pholidota* in one pool on Maui was “no more than a couple dozen.” Given that this species is only known from seven pools in the entire state, its numbers in Hawaii are assumed to be small. Population numbers and numbers of individuals outside the U.S. are unknown.

THREATS:

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

On the island of Hawaii, Dr. R. Brock (pers. comm., 1998) estimates that up to 90 percent of the anchialine pools have been destroyed or altered by human activities. Introduction of alien fish or bait-fish into such pools may be a major contribution to the decline of these shrimp (see below). Although the six known Maui pools, which contain *Calliasmata pholidota*, occur within a protected State reserve, habitat modifications by early Hawaiians and later inhabitants have occurred in the area. Dumping of refuse and the introduction of alien fish threaten the known populations on the island of Hawaii. Damage from use of anchialine pools for swimming and bathing has been documented in the Hawaiian Islands (Brock, in litt. 1985). However, this is not believed to be a serious problem in the Maui pools where *Calliasmata pholidota* occurs. Such impacts to the pool on the island of Hawaii are possible but have not, at present, been

documented. The status of occupied habitats outside the U.S. is not known.

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

Not applicable.

C. Disease or predation.

In Hawaii, predation is considered to be the greatest threat to intact anchialine pool ecosystems (Bailey-Brock and Brock 1993; R. Brock, pers. comm., 1998). Anchialine pools have been used to discard or hold bait-fish and/or aquarium fish (Bailey-Brock and Brock 1993). These fish either directly consume the native shrimp or, as with introduced tilapia (*Oreochromis mossambica*), out-compete the native herbivorous species of shrimp which typically serve as the prey-base for the rarer, predatory species of shrimp. Information on threats from disease or predation outside the U.S. is not available.

D. The inadequacy of existing regulatory mechanisms.

No current protection.

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

In Hawaii, the Maui population(s) occur in areas that were volcanically active as little as 250 years ago. The anchialine pool on the island of Hawaii that contains *Calliasmata pholidota* occurs in an area that could be destroyed by on-going volcanic or land subsidence events. However, neither of these pose an imminent threat.

FOR RECYCLED PETITIONS:

- a. Is listing still warranted? ___
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? ___
- c. Is a proposal to list the species as threatened or endangered in preparation? ___
- d. If the answer to c. above is no, provide an explanation of why the action is still precluded.

LAND OWNERSHIP: In Hawaii, the seven anchialine pools known to contain *Calliasmata pholidota* occur on State land. The six Maui pools are located on a natural area reserve, thus receiving some degree of protection. The Hawaii Island pool occurs on land managed by a different State agency and is not afforded protection.

PRELISTING: In Hawaii, six of the known pools containing *Calliasmata pholidota* lie within a state natural area reserve. The rarity of this shrimp contributed to the current protection received by the Maui anchialine pools (Holthuis 1973). No conservation agreements between Federal, State, or private landowners have been drafted or initiated and, aside from placement of some pools within reserves, virtually no conservation activities have been conducted.

The Sinai Peninsula population is represented in a single anchialine pool that has been fenced and posted for protective measures.

REFERENCES:

- Bailey-Brock, J.H. and R.E. Brock. 1993. Feeding, reproduction, and sense organs of the Hawaiian anchialine shrimp *Halocaridina rubra* (Atyidae). *Pacific Science* 47: 338-355.
- Holthuis, L.B. 1973. Caridean shrimps found in land-locked saltwater pools at four Indo-west Pacific localities (Sinai Peninsula, Funafuti Atoll, Maui and Hawaii Islands), with the description of one new genus and four new species. *Zool. Verhadenlingen* 128: 3-55.
- Maciolek, J.A. 1983. Distribution and biology of Indo-pacific insular hypogeal shrimps. *Bulletin of Marine Science* 33: 606-618.

LISTING PRIORITY (* after number)

THREAT

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	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:

Imminence:

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, removal of candidates, and listing priority changes.

Approve: Rowan Gould March 6, 2003
Regional Director, Fish and Wildlife Service Date

Concur: _____
Director, Fish and Wildlife Service Date

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks:

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Date of annual review: 2/03
Conducted by: _____

Comments:

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