

## DEPARTMENT OF THE INTERIOR

## Fish and Wildlife Service

## 50 CFR Part 17

**Endangered and Threatened Wildlife and Plants; Listing the Hawaiian (Oahu) Tree Snails of the Genus *Achatinella*, as Endangered Species**

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

**ACTION:** Final rule.

**SUMMARY:** The Service determines all species of the genus *Achatinella* to be Endangered. The Service was petitioned by Mr. Alan D. Hart to review the status of the genus. A review was published in the *Federal Register* (44 FR 54011) on September 17, 1979. The Service proposed Endangered status for all species of the genus *Achatinella* on June 26, 1980 (45 FR 43358-43360). The Oahu tree snails, genus *Achatinella*, occur only on Oahu in the State of Hawaii. This action is being taken because of the decline of the genus resulting from habitat destruction, excessive collecting, and predation by introduced animals. The rule provides protection to wild populations of this genus.

**DATES:** This rule becomes effective on February 12, 1982.

**ADDRESSES:** Questions concerning this action may be addressed to Director (OES), U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240. Comments and materials related to the rule are available for public inspection by appointment during normal business hours at the Service's Office of Endangered Species, Suite 500, 1000 North Glebe, Arlington, Virginia.

**FOR FURTHER INFORMATION CONTACT:** Mr. John L. Spinks, Jr., Chief, Office of Endangered Species, U.S. Fish and Wildlife Service, Washington, D.C. 20240 (703/235-2771).

**SUPPLEMENTARY INFORMATION:****Background**

On June 28, 1980, the Service published a proposed rule in the *Federal Register* (45 FR 43358-60) advising that sufficient evidence was on file that the Oahu tree snails, genus *Achatinella*, were Endangered species pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). That proposal summarized the factors thought to be contributing to the likelihood that these snails are Endangered. *Achatinella* is highly vulnerable to human activities because the various species have (1) small geographical ranges, (2) a low reproductive rate, (3) virtually no defense mechanisms, and

(4) a dependency on relatively intact native forest conditions. Owing to extensive deforestation and other human-induced alterations of Oahu's native environment, more than half of the species in the genus may be recently extinct.

The proposed rule also specified the prohibitions which would be applicable if such a determination were made, and solicited comments, suggestions, objections, and factual information from interested persons. Included in this proposal was a summary of comments in response to the notice of review as well as a summary of the status of these species.

A letter was sent to Governor Ariyoshi of the State of Hawaii on July 1, 1980 notifying him of the proposed Endangered status for the Oahu tree snails. On June 30, 1980, letters were sent to appropriate Federal agencies, local governments and other interested parties notifying them of the proposal and soliciting their comments and suggestions. Official comments were received from Governor Ariyoshi of Hawaii; the Department of the Army, Washington, D.C.; and Headquarters, United States Army Support Command, Hawaii.

**Summary of Comments and Recommendations**

Section 4(b)(1) of the Act requires that a summary of all comments and recommendations be published in the *Federal Register* prior to adding any species to the List of Endangered Wildlife and Plants. All interested parties were invited in the proposed rule to submit factual reports or information which might contribute to the formulation of a final rule.

All written public comments received during the period June 26, 1980 through September 24, 1980 were considered. These comments are summarized below along with comments offered by 9 individuals at a public meeting on the proposal held in Honolulu on August 19, 1980.

In addition to the comments received from Governor Ariyoshi and the Army, written comments were received from 13 individuals and representatives of various organizations.

Governor Ariyoshi commented that despite the lack of biological information on *Achatinella*, the genus should be accorded protective status.

The Department of the Army commented that further dramatic reductions in the native forests are unlikely because of the relative inaccessibility and ruggedness of the terrain where the remaining forest are found. The Army also stated that

measures have been taken to minimize the threat of accidental forest fires caused by training activities to the native forest habitats of *Achatinella*. The Army concurred with the Service decision not to designate Critical Habitat for the genus because it would make these animals more vulnerable to collection. The Army stated that listing may contribute to the further decline of the genus by promoting collecting and that public education would provide greater protection for the species than listing. The Service notes that the existence of and threats to *Achatinella* have been widely discussed in popular periodicals (Hart, 1975, 1978) and newspapers (Whitten, 1980) and the further publicity that might accompany listing is unlikely to stimulate additional collecting. The Service acknowledges the great value of public education for the conservation of any species and notes that among the benefits of listing is the publication and distribution of educational materials on Endangered and Threatened species. For example, a series of educational leaflets on some listed Endangered and Threatened Hawaiian birds has been produced under a Service contract by the Cooperative Extension Service of the University of Hawaii (Leaflets 212 through 215). Similar materials may be developed for *Achatinella* as a result of listing of the genus.

All 13 of the written comments from individuals and organizations supported the listing of the genus *Achatinella* as Endangered. Most comments identified various forms of habitat destruction as major factors in the decline of the genus. Most comments cited various threats to the genus that the Service had previously identified in the proposed rule. These threats include taking, introduced predatory snails and rodents, and habitat destruction resulting from fires, introduced plants, and feral mammals.

Nine comments identified the exotic predatory snail *Euglandina rosea* as a threat to *Achatinella*. *Euglandina* was introduced into Hawaii for biological control of the giant African snail, an introduced pest. Some of the comments contained personal observations of *Euglandina rosea* predation on *Achatinella*, the extirpation of *Achatinella* populations corresponding with the arrival of *Euglandina rosea* in their habitat, and recent expansions in the range of *Euglandina rosea* that threaten remaining *Achatinella* populations.

Two comments suggested that the increase in *Euglandina rosea* may increase populations of the predatory

flatworm *Geoplana* sp. The increased numbers of these native flatworms could pose an additional threat to *Achatinella*.

Predation by rats, probably the roof rat (*Rattus rattus*), was cited in four comments as a threat to *Achatinella*.

The dependence of *Achatinella* on native forest plant species was cited in seven comments, although two of these comments noted that certain species of *Achatinella* may be found on a few introduced plants. The Service recognizes that the destruction of native vegetation by human activities and encroachment by introduced plants, notably *Clidemia hirta*, is a threat to *Achatinella*.

The destructive activities of feral mammals, mostly pigs and goats, was identified by four commentors as a threat to *Achatinella* forest habitat.

Six comments noted the scientific value of *Achatinella* and expressed a need for more research, especially on the biological requirements of these species. One of these comments expressed the concern that listing as Endangered might curtail needed research on the genus. The Service responds that, although listing as Endangered would protect *Achatinella* from collecting, the Service may grant special permits for scientific purposes or to enhance the propagation or survival of a species.

Comments from two scientific societies, two conservation organizations, and one private individual requested that Critical Habitat be designated for the genus *Achatinella*. They suggested that this Critical Habitat should be large enough and described in general enough terms, such as all forest areas above a certain elevation, that *Achatinella* localities are not pinpointed and thereby made vulnerable to collecting. Current criteria for designating Critical Habitat (50 CFR Part 424.12) do not provide for including areas outside of a species' range in Critical Habitat as a means of obscuring the exact location of populations. The Service believes that, given these restrictions on the area that may be designated Critical Habitat, it is best not to designate Critical Habitat for *Achatinella* for the reasons given below in the Critical Habitat section of this rule. Even though Critical Habitat is not being designated for *Achatinella*, these species still receive the full protection as Endangered species under the Endangered Species Act of 1973, as amended.

The Service notes that there is a widespread and erroneous belief that a Critical Habitat designation is somewhat akin to the establishment of a wildlife refuge. This is not the case.

Critical Habitat applies only to Federal activities and is an official notification to the agencies that their responsibilities under Section 7 of the Endangered Species Act are applicable in a certain area.

Two comments stated that lack of Critical Habitat designation does not provide means for the elimination of such threats to *Achatinella* as introduced plants and animals. The Service notes that measures to eliminate these threats can be incorporated into a recovery plan for *Achatinella* whether or not Critical Habitat is designated.

One comment agreed with the Service's decision not to designate Critical Habitat because publication of maps would call the attention of collectors to the remaining populations.

One comment listed collecting as one of the continuing threats to *Achatinella*. Three comments stated that commercial taking no longer appears to be a factor in the continuing decline of the genus. The Service agrees that commercial activity in *Achatinella* is limited. The Service notes, however, that cash offers for *Achatinella* shells are still made (Hawaiian Shell News; June, 1980; page 11) and indicate a persistent demand by collectors.

The impacts of the recreational pursuits of hiking, camping, and hunting were discussed in three comments. Two of these comments stated that the impacts of these activities on *Achatinella* and its habitats was minor, but a third comment stated that these impacts can be expected to increase. All three of these comments agreed that hunting would be of benefit to the Hawaiian tree snails and their habitat by controlling populations of introduced mammals, such as rats and feral pigs and goats, that are destructive to the snails or their habitat.

Three comments identified the U.S. Department of Agriculture's proposed Tri-fly Eradication Program as a potential new threat to the Hawaiian tree snails. These comments expressed the fear that pesticides, especially malathion, will be applied to native forests without prior toxicity studies on native snails. The Service notes that any federally funded or authorized plan to apply pesticides on *Achatinella* habitat would require consultation with the Service.

One comment suggested that firebreaks be built around military firing areas and that maneuvers using live ammunition be curtailed during droughts to protect remaining *Achatinella* habitat from accidental fires. These measures are among those that the Army has agreed to implement to protect native forests.

One comment identified the potential threat of placing powerline towers or helicopter pads on mountains ridgetops, where much of the remaining native forest habitat of *Achatinella* is found. The Service notes that such projects, if federally funded or authorized, would be subject to consultation with the Service to insure that they are not likely to jeopardize the continued existence of any species of *Achatinella*.

Among his comments supporting the listing of the genus *Achatinella* as Endangered, Yoshio Kondo of the Bernice P. Bishop Museum noted that the lists of Hawaiian tree snail species published in the Federal Register (42 FR 57492 and 43 FR 44806-44808) were modified from Kondo (1970). The Service recognizes and is grateful for Dr. Kondo's contributions to mollusk conservation and regrets the inadvertent omission of the citation of that work.

John K. Obata submitted comments describing findings from his field work on *Achatinella* and supporting their listing as Endangered. He estimates that the following nine species exist in numbers less than 20 individuals each: *Achatinella bellula*, *A. bulimoides*, *A. byronii*, *A. fulgens*, *A. leucorraphe*, *A. lorata*, *A. swiftii*, *A. taeniolata*, and *A. turgida*. Mr. Obata indicates that the remaining extant species are declining rapidly and suffer from collection by hikers. He estimates that there are less than 50 remaining individuals each of *A. concavospira* and *A. pulcherrima*; less than 100 remaining individuals of *A. pupukanioe* and *A. fuscobasis*; less than 200 remaining individuals each of *A. curta*, *A. decipiens*, and *A. lila*; and less than 400 remaining individuals each of *A. mustelina* and *A. sowerbyana*. Based on his observation of this genus over the last 20 years, Mr. Obata estimates that present population levels are only 5 to 10% of those existing in 1960 and that they continue to decline. He stated that predation by the introduced predatory snail *Euglandina rosea* is a factor in the decline of these species, especially of *A. sowerbyana*.

Dr. Michael G. Hadfield of the University of Hawaii summarized the results of a six-year study of a population of *A. mustelina*, in which he participated. The study involved the field tagging and measurement of individual snails in the Waianae Mountains. *Achatinella mustelina* grows at a rate of only a 2 mm increase in shell length per year and is estimated to reach sexual maturity in 6 to 7 years. *Achatinella mustelina* was abundant at the study site in 1974. *Euglandina rosea*, an introduced predatory snail, was found near the study site in 1978. by

August, 1979 shells of *Euglandina rosea* were abundant at the study site but no living individuals of *Achatinella* could be found. Dr. Hadfield concluded that, since *Achatinella mustelina* has a low growth rate and fecundity and matures late, populations are highly vulnerable to the removal of adults.

The public meeting held on the proposed Endangered status for the genus *Achatinella* was attended by Service representatives and eleven other individuals. Nine of these individuals presented comments on or asked questions about the proposal or the consequences of listing. These comments and questions are summarized below.

Three comments asked questions concerning the effect of listing *Achatinella* on research on the genus and how permits may be obtained for such research. The Service may grant special permits to individuals or organizations for scientific purposes or to enhance the propagation or survival of a species. Ongoing and new research that fits these criteria will be granted permits. A recovery team may make specific recommendations for further research. Federal funds for research on *Achatinella* could be made available through a future cooperative agreement with the State of Hawaii.

Several questions were asked concerning the meaning of Critical Habitat and why it was not designated for *Achatinella*. The reasons that the Service is not designating Critical Habitat for *Achatinella* are discussed below in the Critical Habitat section of this rule. If at some future time the Service determines that it would be prudent to designate Critical Habitat for *Achatinella*, such a designation would be made according to the requirements of the species as set forth in § 424.12 of Title 50 of the Code of Federal Regulations. Among the possible requirements that may be included in Critical Habitat is space for individual and population growth. The Service notes that, even though Critical Habitat is not being determined at this time, *Achatinella* will still receive the full protection of Section 7 of the Act. Current distribution records can also be made available to the Army and other agencies so that their activities can be planned so that they are unlikely to jeopardize remaining *Achatinella* populations.

Two commentators were concerned about how the Tri-fly Eradication program might affect *Achatinella* and what protection is available for this genus under the Endangered Species Act. The Act requires Federal agencies to confer with the Service on any of

their activities that are likely to jeopardize a species proposed for Endangered or Threatened status. The genus *Achatinella*, by being listed as Endangered, would receive full protection of Section 7 as described below under "Effect of this Rule."

One comment asked what could be done about the threat to *Achatinella* by the introduced predatory snail *Euglandina rosea*. The Service responds that any Federal effort to expand the range of *Euglandina rosea* on Oahu would require consultation with the Service. Programs to limit or eliminate *Euglandina rosea* on Oahu may be considered in developing a recovery plan for *Achatinella*.

One individual asked who determines that a recovery team will be formed. The Service responds that recovery teams are appointed by the Director of the Service with input from the appropriate regional and area offices. These teams are appointed for listed species in the order of the species' recovery priority.

After a thorough review and consideration of all available information, the Director has determined that all existing species of the genus *Achatinella* are in danger of becoming extinct throughout all or a portion of their range due to one or more of the factors described in Section 4(a) of the Act. These factors and their application to *Achatinella* are as follows:

1. *The present or threatened destruction, modification, or curtailment of its habitat or range.* Botanical literature and subfossil deposits indicate that native forests covered much of Oahu in the prehuman era. By 1978, approximately 85% of the original forest cover had been destroyed or radically altered. Most remaining native forest occurs at an altitude above 1,200 feet at the heads of ravines and upper valleys and above 1,500 feet on most ridges of the Koolau and Waianae Mountain ranges. Widespread deforestation followed the arrival of non-native settlers during the 1800's. Most woodlands below 1,200 feet were cleared. The *Achatinella* in these forests disappeared.

The false staghorn fern (uluhe), *Dicranopteris linearis* is forming dense thickets in the Koolau range, smothering the native forest and impacting the snails. In healthy native wet forest ecosystems, uluhe is present but inconspicuous. The overgrowth of uluhe very likely stems from human disturbance. Fires have opened up lower ridge areas to the fern. In higher regions, feral mammals (especially pigs) have rooted up and opened up portions of understory, allowing invasion by exotics.

2. *Overutilization for commercial, sporting, scientific, or educational purposes.* Excessive human collection of *Achatinella* snails for their beautiful, varied and often rare shells has contributed to the decline of these species. The most intense period of collecting was from 1830 to 1940. Since each shell is unique in shape, size, color and pattern, collectors took many of each variety. Probably millions of snails were collected for their shells. Two private collections made at the turn of the century contain more than 100,000 shells. Many private collections of *Achatinella* exist in Honolulu alone.

Some species of *Achatinella* (*A. papyracea*, *A. juncea*, *A. buddii*) were rare even in the 1930's while other species (*A. lehuiensis*, *A. thaunumi*, *A. spaldingi*) were extremely rare when discovered and became extinct soon afterwards. The days of *Achatinella*'s widespread abundance are gone. It is now believed that only 19 of the 41 *Achatinella* species still exist. People are still collecting live *Achatinella* for shell leis and other non-scientific purposes. A limited number of hiking trails are accessible to the general public in Oahu's mountains. Remnant colonies of *Achatinella* exist near some of these trails. Since the popularity of hiking is increasing, so is *Achatinella*'s exposure to more people and would-be collectors.

3. *Disease or predation.* Prior to man's arrival on Oahu, *Achatinella* had few predators among the native terrestrial fauna. Within the past 100 years, two types of human-introduced predators have become major threats to *Achatinella*'s existence—rodents and the carnivorous land snail, *Euglandina rosea*.

Of the three species of introduced rats in Hawaii, the arboreal roof rat (*Rattus rattus*) poses the greatest problem. It is found throughout the dense wet forests. Many rat-killed shells are found throughout the Waianae range.

*Euglandina rosea* is a carnivorous snail that was imported to Oahu from Florida to control *Achatina fulica*, the giant African snail. The giant African snail had become an uncontrollable pest in the lowland regions shortly after its introduction by a private individual. *Euglandina* established itself, increased dramatically in numbers and migrated from the dry, lower elevations to the mountain forests where it has decimated a substantial portion of Oahu's native land snail fauna. In areas where *Euglandina* is long established, living *Achatinella* are usually very rare or absent.

4. *The inadequacy of existing regulatory mechanisms.* These species

occur within State Forest Reserves and Conservation Districts. The State's Department of Land and Natural Resources/Division of Forestry administers the regulations that apply to these lands.

Listing these species as Endangered pursuant to the Endangered Species Act may give them added protection. Private landowners whose lands occur within a conservation district may apply to the Department of Land and Natural Resources for a permit to change from current land use. If Endangered species are within the area under consideration, the Department of Land and Natural Resources should consider this point in reviewing these applications. This consideration could result in the snails' habitat remaining intact.

5. *Other natural or man-made factors affecting its continued existence.* Oahu's growing human population is causing problems for *Achatinella*.

Approximately 80% of the State's population lives on Oahu. Increasing numbers of people will use the island's limited forest reserves which are managed using a multiple-use concept. Activities such as military exercises and artillery practice, hiking and hunting, as well as forestry will continue to exert pressure on remnant native ecosystems.

#### Critical Habitat

Section 4(a)(1) states "The Secretary shall by regulation determine whether any species is an endangered species or a threatened species . . . At the time any such regulation is proposed, the Secretary shall also by regulations, to the maximum extent prudent, specify any habitat of such species which is then considered to be critical habitat."

As previously stated in this proposed rule, collecting is one of the reasons for the decline and/or extinction of *Achatinella*. The highly variable colored shells of *Achatinella* have been and are prized by collectors. Publication of detailed location maps delineating Critical Habitat would make these species more vulnerable to taking. For this reason, a decision has been made that Critical Habitat determination for *Achatinella* would not be prudent, since it would further jeopardize these species.

#### Effect of This Rule

Endangered Species regulations published in Title 50 § 17.21 of the Code of Federal Regulations set forth a series of general prohibitions and exceptions which apply to all Endangered species.

With respect to the genus *Achatinella*, all known living species of the genus have the same status and are subject to the protection of the Endangered

Species Act of 1973, as amended. The available data indicate that each component species of this genus is either extinct or in danger of extinction. The species of this genus which are believed to be extinct are:

#### *Achatinella abbreviata*

*A. buddii*  
*A. caesia*  
*A. casta*  
*A. cestus*  
*A. decora*  
*A. dimorpha*  
*A. elegans*  
*A. juddii*  
*A. juncea*  
*A. lehuiensis*  
*A. livida*  
*A. papyracea*  
*A. phaeozona*  
*A. rosea*  
*A. spaldingi*  
*A. stewartii*  
*A. thaahumi*  
*A. valida*  
*A. viridans*  
*A. vittata*  
*A. vulpina*

The species thought to be in danger of extinction are:

#### *Achatinella apexfulva*

*A. bellula*  
*A. bulimoides*  
*A. byronii*  
*A. concavospira*  
*A. curta*  
*A. decipiens*  
*A. fulgens*  
*A. fuscobasis*  
*A. leucorraphe*  
*A. lila*  
*A. lorata*  
*A. mustelina*  
*A. pulcherrima*  
*A. pupukanioe*  
*A. sowerbyana*  
*A. swiftii*  
*A. taeniolata*  
*A. turgida*

Since these snails' habitats are found in rugged, inaccessible terrain, it is possible that some individuals of those species thought to be extinct may still exist. If any individuals of these species are found alive, they would automatically be protected, since the entire genus is Endangered.

With respect to all species of the genus *Achatinella*, all prohibitions of Section 9(a)(1) of the Act, as implemented by 50 CFR 17.21, apply. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, import or export, ship in interstate or foreign commerce in the course of a commercial activity, or sell or offer to sell those species in interstate or foreign commerce. It would also be illegal to possess, sell, deliver, carry, transport, or

ship any such wildlife which was illegally taken, imported or exported. Certain exceptions would apply to agents of the Service and State conservation agencies for limited purposes.

Regulations published in the *Federal Register* of September 26, 1975, (40 FR 44412), codified at 50 CFR 17.22 and 17.23, provide for the issuance of permits to carry out otherwise prohibited activities involving Endangered species under certain circumstances. Such permits are available for scientific purposes or to enhance the propagation or survival of the species. In some instances, permits may be issued during a specified period of time to relieve undue economic hardship which would be suffered if such relief were not available.

Section 7(a) of the Act provides in part, that:

(1) The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act. All other Federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to Section 4 of this Act. (2) Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary after consultation as appropriate with the affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available. (3) Each Federal agency shall confer with the Secretary on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under section 4 or result in the destruction or adverse modification of critical habitat proposed to be designated for such species. This paragraph does not require a limitation on the commitment of resources as described in subsection (d).

Provisions for Interagency Cooperation are codified at 50 CFR Part 402. This rule requires Federal agencies to insure that activities they authorize, fund or carry out are not likely to jeopardize the continued existence of *Achatinella*.

#### National Environmental Policy Act

An Environmental Assessment has been prepared in conjunction with this rule. It is on file at Suite 508, 1000 North Glebe Road, Arlington, Virginia, and

may be examined by appointment during regular business hours. This assessment forms the basis for a decision that this is not a major Federal action which would significantly affect the quality of the human environment within the meaning of section 102(2)(C) of the National Environmental Policy Act of 1969.

The primary author of this rule is Dr. Steven M. Chambers, Office of Endangered Species, U.S. Fish and Wildlife Service, Washington, D.C. 20240 (703/235-1975).

**Note.**—The Service has determined that this is not a significant rule and does not require preparation of a regulatory analysis under Executive Order 12044 and 43 CFR Part 14.

**References**

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**Regulation Promulgation**

Accordingly, § 17.11 of Part 17 of Chapter 1 of Title 50 of the U.S. Code of Federal Regulations is amended as set forth below.

1. Section 17.11 is amended by adding, in alphabetical order under "SNAILS," the following to the list of Endangered and Threatened wildlife:

**§ 17.11 Endangered and threatened wildlife.**

Species		Historic range	Status	When listed	Critical habitat	Special rule
Scientific name	Common name					
<i>Achatinella</i> all species.....	Snails: Snails, Oahu tree.	Hawaii.....	E	2-12-81	NA	NA

Dated: January 2, 1981.

**Robert S. Cook,**  
 Acting Director, Fish and Wildlife Service.  
 [FR Doc. 81-1116 Filed 1-12-81; 8:45 am]  
**BILLING CODE 4310-55-M**