

## Amendment to the Recovery Plan for the O‘ahu Tree Snails of the Genus *Achatinella*

Original Recovery Plan Approved: [June 30, 1992](#)

Original Recovery Plan Prepared by: Pacific Region, U.S. Fish and Wildlife Service

Recovery Plan Amendment Approved:

  
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Acting Regional Director, Pacific Region  
U.S. Fish and Wildlife Service

Date 7 Aug 2019

**Species addressed in Amendment:** The following 41 species of O‘ahu Tree Snails (*Achatinella abbreviata*, *A. apexfulva*, *A. bellula*, *A. buddii*, *A. bulimoides*, *A. byronii*, *A. caesia*, *A. casta*, *A. cestus*, *A. concavospira*, *A. curta*, *A. decipiens*, *A. decora*, *A. dimorpha*, *A. elegans*, *A. fulgens*, *A. fuscobasis*, *A. juddii*, *A. juncea*, *A. lehuiensis*, *A. leucoraphe*, *A. lila*, *A. livida*, *A. lorata*, *A. mustelina*, *A. papyracea*, *A. phaeozona*, *A. pulcherrima*, *A. pupukanioe*, *A. rosea*, *A. sowerbyana*, *A. spaldingi*, *A. stewartii*, *A. swiftii*, *A. taeniolata*, *A. thaanumi*, *A. turgida*, *A. valida*, *A. viridans*, *A. vittata*, and *A. vulpina*)

We have analyzed all of the best available information and find that there is a need to amend the recovery criteria for the O‘ahu tree snails (*Achatinella* spp.) that have been in place since the recovery plan was completed in 1992. In this amendment, we discuss the adequacy of the existing recovery criteria, identify amended recovery criteria, and present the rationale supporting the recovery plan modification. The modification is to be shown as an appendix that supplements the recovery plan, superseding only the Objectives section (page 33 of the recovery plan [USFWS 1992]).

### BACKGROUND INFORMATION

Recovery plans should be consulted frequently, used to initiate recovery activities, and updated as needed. A review of the recovery plan and its implementation may show that the plan is out of date or its usefulness is limited, and therefore warrants modification. Keeping recovery plans current ensures that the species benefits through timely, partner-coordinated implementation based on the best available information. The need for, and extent of, plan modifications will vary considerably among plans. Maintaining a useful and current recovery plan depends on the scope and complexity of the initial plan, the structure of the document, and the involvement of stakeholders.

An amendment involves a substantial rewrite of a portion of a recovery plan that changes any of the statutory elements. The need for an amendment may be triggered when, among other possibilities: (1) the current recovery plan is out of compliance with regard to statutory requirements; (2) new information has been identified, such as population-level threats to the species or previously unknown life history traits, that necessitates new or refined recovery actions and/or criteria; or (3) the current recovery plan is not achieving its objectives. The amendment replaces only that specific portion of the recovery plan, supplementing the existing recovery plan, but not completely replacing it. An amendment may be appropriate in cases where significant plan improvements are needed, but resources are too scarce to accomplish a full recovery plan revision

in a short time.

Although it would be inappropriate for an amendment to include changes in the recovery program that contradict the approved recovery plan, it could incorporate study findings that enhance the scientific basis of the plan, or that reduce uncertainties as to the life history, threats, or species' response to management. An amendment could serve a critical function while awaiting a more comprehensive revised recovery plan by: (1) refining and/or prioritizing recovery actions that need to be emphasized, (2) refining recovery criteria, or (3) adding a species to a multispecies or ecosystem plan. An amendment can, therefore, efficiently balance resources spent on modifying a plan against those spent on managing implementation of ongoing recovery actions.

#### **METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT**

A draft of the updated recovery criteria was developed and sent to the Snail Extinction Prevention Program (SEPP), State of Hawai'i Division of Forestry and Wildlife. The SEPP program reviewed and submitted comments through Dr. David Sisco, the Director of SEPP. Input was also solicited from Dr. Michael G. Hadfield, University of Hawai'i, expert in the biology of O'ahu tree snails. All comments were considered and incorporated into these updated downlisting and delisting criteria for the O'ahu tree snails.

A draft of this recovery plan amendment was published for public review on January 31, 2019 (84 FR 790). In addition, we sought peer review. Please see the Appendix for a summary of the comments received and our responses.

#### **ADEQUACY OF RECOVERY CRITERIA**

Section 4(f)(1)(B)(ii) of the Endangered Species Act (Act) requires that each recovery plan shall incorporate, to the maximum extent practicable, "objective, measurable criteria which, when met, would result in a determination...that the species be removed from the list." Legal challenges to recovery plans (see *Fund for Animals v. Babbitt*, 903 F. Supp. 96 (D.D.C. 1995)) and a Government Accountability Audit (GAO 2006) also have affirmed the need to frame recovery criteria in terms of threats assessed under the five listing factors.

#### **Recovery Criteria**

See previous version of criteria in the Recovery Plan for O'ahu Tree Snails of the Genus *Achatinella*, page 33 (USFWS 1992).

#### **Synthesis**

The status and population size of each of the listed species in the genus *Achatinella* varies, but each continues to face the same threats identified in the recovery plan (USFWS 1992), but with increasing intensity. All extant populations are regularly monitored, and efforts to find new populations are ongoing (Hawaii Department of Land and Natural Resources (DLNR) 2014). Eleven species are maintained in captivity. Habitat loss and degradation continue to threaten *Achatinella* spp. and their host plants. Predation by the carnivorous snail *Euglandina rosea*, rats (*Rattus* spp.), Jackson's chameleon (*Chamaeleo jacksonii*), the terrestrial flatworms *Geoplana septemlineata* and *Platydemis monokwari*, and potentially the terrestrial snails *Oxychilus allinarius* and *Gonaxis kibwexiensis* continues to negatively impact wild populations. The response of *Achatinella* spp. to climate change is not known, but the anticipated hotter and dryer

conditions are not favorable to these species.

#### **AMENDED RECOVERY CRITERIA**

Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened, or that the protections afforded by the Act are no longer necessary and O‘ahu tree snails may be delisted. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Downlisting is the reclassification of a species from endangered to threatened. The term “endangered species” means any species (species, subspecies, or distinct population segment) that is in danger of extinction throughout all or a significant portion of its range. The term “threatened species” means any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Using available data on collection localities, survey history, habitat distribution, and genetic differentiation, appropriate Geographic Units (GUs) and/or Evolutionarily Significant Units (ESUs) should be identified and delineated for each species of *Achatinella*. A GU for a morphotype (*i.e.*, any of a group of different types of individuals of the same species in a population) of an *Achatinella* tree snail species is defined as the landscape distribution of the morphotype in relation to other morphotypes of the same species. Tree snail morphotypes and GUs will be determined by expert tree snail ecologists and taxonomists working with botanists and landscape ecologists and in consultation with the State of Hawai‘i and the U.S. Fish and Wildlife Service (Service). ESUs are groups within a species that are defined by genetic characters that cluster individuals into populations that are exclusive from other such clusters (Vogler and DeSalle 1994; Waples, 1995, 1998; Pennock and Dimmick, 1997; Riddle and Hafner 1999; Fraser and Bernatchez 2001). The delineation of genetically based ESUs should take precedence over the GUs of morphotypes (see Welch (1938) and Holland and Hadfield (2002, 2007) for a comparison of morphotype GUs and ESUs in *Achatinella mustelina*). Whenever possible, ESUs will be defined by analysis of genetic data for each extant species, following the most current and rigorous scientific standards available at the time.

We provide both downlisting and delisting criteria for the O‘ahu tree snails, which supersede those included in the Recovery Plan for O‘ahu Tree Snails of the Genus *Achatinella* (USFWS 1992), as follows:

#### **Downlisting Recovery Criteria**

To downlist any of the O‘ahu tree snail species from endangered to threatened, the following criteria must be met for each species being considered for downlisting:

1. At least 6 to 10 stable populations (possibly actively managed) are distributed across the known historical range of the species. Also, each ESU of the species (or each GU if ESUs have not been identified) must be represented by one or more stable populations; thus any species for which more than six GUs or ESUs are identified will require more than six stable populations to represent every GU or ESU.
2. To be considered stable, a population must number at least 300 individuals distributed across all size classes combined, and must have a population growth curve that is stable or positive for at least 4 of 5 sequential years.

## **Delisting Recovery Criteria**

For any of the O‘ahu tree snail species to be considered fully recovered, it must maintain viable free-living populations in areas actively managed to protect native vegetation. The following criteria must be met for any of the O‘ahu tree snail species to be considered for delisting:

1. At least 12 to 20 populations are distributed across the known historical range of the species. Also, each ESU of the species (or each GU if ESUs have not been identified) must be represented by at least 2 populations; thus any species for which more than 6 GUs or ESUs are identified will require more than 12 populations to sufficiently represent every GU or ESU.
2. Each of these populations must have a population growth curve that is stable or positive for at least 7 of 10 sequential years, and have available habitat that is capable of supporting natural dispersal, expansion of the occupied range, and positive population growth. Any new populations that are established through natural dispersal from these populations should also maintain a positive growth trajectory for 4 of 5 sequential years.
3. At least 12 populations must number at least 300 individuals, distributed across all size classes combined.

All classification decisions consider an analysis of the following five factors: (1) is there a present or threatened destruction, modification, or curtailment of the species’ habitat or range; (2) is the species subject to overutilization for commercial, recreational scientific or educational purposes; (3) is disease or predation a limiting factor; (4) are there inadequate existing regulatory mechanisms in place outside the Act (taking into account the efforts by states and other organizations to protect the species or habitat); and (5) are other natural or manmade factors affecting its continued existence. When delisting or downlisting a species, we first propose the action in the *Federal Register* and seek public comment and peer review of our analysis. Our final decision is announced in the *Federal Register*.

## **Rationale for Recovery Criteria**

The amended downlisting and delisting criteria are based upon the most up-to-date information about the species’ biology and threats and expert opinion.

In 2003, the Service recommended active management of 10 populations of each species of O‘ahu tree snail in order to stop the continuing declines, in numbers of populations, numbers of individuals, geographic ranges, and species’ genetic diversity (USFWS 2003). In practice, the management of six to eight populations has been approved for stabilizing one species, *Achatinella mustelina* (U.S. Army Garrison, 2008). Successful protection and management of several populations of *A. mustelina* have demonstrated that each of the extant species of federally listed O‘ahu tree snails can be stabilized by actively managing 6 to 10 populations of each species. This estimate of 6 to 10 populations per species is based on the snails’ extreme vulnerability to catastrophic decline from predation by non-native predators (snails, rats, flatworms, and chameleons; Hadfield and Mountain 1981; Hadfield 1986; Hadfield *et al.* 1993; Hadfield and Saufler 2009; Holland *et al.* 2010), and the need to protect the remaining genetic diversity across the historical range of each species (Erickson and Hadfield 2014; Price and Hadfield 2014; Price *et al.* 2015; Sischo *et al.* 2016), as demonstrated for *A. mustelina* (Holland and Hadfield. 2002).

The population size threshold of 300 individual snails, required for a population to contribute to meeting downlisting or delisting criteria, is based on the recorded size of a growing wild population of *A. mustelina* in the Pahole Natural Area Reserve (Hadfield *et al.* 1993). This population consisted of a single group of snails in an unprotected 25-square-meter area that was relatively free of predation. However, the population was eventually decimated by non-native predatory snails and rats prior to reaching a stable population size or carrying capacity. In a population of this size with a typical distribution of size classes, approximately 120 individuals are anticipated to be adults (Sischo pers. comm. 2019). Depending on the area that is actively managed, the size of a population may increase beyond 300 snails.

The recovery criteria reflect the best available and most up-to-date information about the species and their habitat and threats. The recovery criteria reflect all known threats to these species. These include protection of suitable habitat to sustain the ecological, morphological, and genetic diversity of the species (Factor A), predation (Factor C), and management of anthropogenic threats (Factor E) such that the populations are self-sustaining and stable.

The amended recovery criteria for O‘ahu tree snails support representation by ensuring the ecological, morphological, behavioral, and genetic diversity of the species is conserved across their historic range. The criteria support resiliency through stable or increasing populations. The criteria support redundancy by recommending distribution throughout their historical range. The recovery criteria are objective and measurable. Information is accurate, unbiased, and based upon the best available data known at this time.

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#### **PERSONAL COMMUNICATIONS**

Sischo, D. 2019. Email communication regarding age distribution in *Achatinella*.

## APPENDIX. SUMMARY OF PUBLIC, PARTNER, AND PEER REVIEW COMMENTS RECEIVED

### Summary of Public Comments

We published a notice of availability in the *Federal Register* on January 30, 2019 (84 FR 790-795) to announce that the draft amendment to the Recovery Plan for the O‘ahu Tree Snails of the Genus *Achatinella* was available for public review, and to solicit comments by the scientific community, State and Federal agencies, Tribal governments, and other interested parties on the general information base, assumptions, and conclusions presented in the draft revision. An electronic version of the draft amendment was posted on our Species Profile website ([https://ecos.fws.gov/docs/recovery\\_plan/Achatinella\\_Draft%20Recovery%20Plan%20Amendment\\_20180801.pdf](https://ecos.fws.gov/docs/recovery_plan/Achatinella_Draft%20Recovery%20Plan%20Amendment_20180801.pdf)). We also developed and implemented an outreach plan that included: (1) publishing a news release on our national webpage (<https://www.fws.gov/news/>) on January 30, 2019, (2) sending specific notifications to Congressional contacts in Hawaii’s first and second Congressional Districts, and (3) sending specific notifications to key stakeholders in conservation and recovery efforts. These outreach efforts were conducted in advance of the *Federal Register* publication to ensure that we provided adequate notification to all potentially interested audiences of the opportunity to review and comment on the draft amendment.

We received three responses in total. These included comments from interested citizens as well as non-governmental organizations and interest groups.

Public comments ranged from providing minor editorial suggestions to specific recommendations on plan content. We have considered all substantive comments; we thank the reviewers for these comments and to the extent appropriate, we have incorporated the applicable information or suggested changes into the final recovery plan amendment. In general, these comments did not lead to significant changes from the draft recovery plan amendment. Below, we provide a summary of public comments received; however, some of the comments that we incorporated as changes into the recovery plan amendment did not warrant an explicit response and, thus, are not presented here. We also provided copies of all comments received during the formal public comment period to all relevant Federal agencies for their consideration prior to implementation of the final recovery plan, in accordance with section 4(f)(5) of the Act.

*Comment (1):* Concern that, “criteria are being added in the absence of any scientific peer review and that this will lead to a failure on the Service’s part to follow the best-available science.”

*Response:* Peer review was conducted following the publication of the Notice of Availability, and in accordance with the requirements of the Endangered Species Act (Act). Below we provide a detailed summary of peer review comments and our responses, as appropriate.

*Comment (2):* Concern that, “the decision to update recovery criteria for these 42 species as a group is indicative of the Service moving away from utilizing recovery teams and outside scientific expertise.”

*Response:* Section 4 of the Act provides the Service with the authority and discretion to appoint recovery teams for the purpose of developing and implementing recovery plans. The current effort to update recovery plans with quantitative recovery criteria for what constitutes a recovered species

is not indicative of the future need for, and does not preclude the future utilization of, recovery teams to complete recovery planning needs for listed species.

*Comment (3):* New and significant information has been developed in the years since the existing recovery plan was adopted. Updating this plan can serve to better inform the Service, the regulated community, and Federal, State, and local resource agencies.

*Response:* A recovery plan should be a living document, reflecting meaningful change when new substantive information becomes available. Keeping a recovery plan current increases its usefulness in recovering a species by ensuring that the species benefits through timely, partner-coordinated implementation based on the best available information.

*Comment (4):* The Service should consider whether the updated recovery criteria would be less burdensome on Federal agencies and the regulated community than the existing criteria.

*Response:* Recovery plans are guidance documents that outline how best to help listed species achieve recovery, but they are not regulatory documents. Recovery plans are intended to establish goals for long-term conservation of listed species and define criteria that are designed to indicate when the threats facing a species have been removed or reduced to such an extent that the species may no longer need the protections of the Act.

Recovery criteria are achieved through the funding and implementation of recovery actions by both the Service and our partners. In addition to the existing recovery actions included in each of these recovery plans, the amendments address the need for any new, site-specific recovery actions triggered by the modification of recovery criteria, along with the costs, timing, and priority of any such additional actions. Because recovery plans are not regulatory documents, identification of an action to be implemented by any public or private party does not create a legal obligation beyond existing legal requirements. Nothing in a recovery plan should be construed as a commitment or requirement that any Federal agency obligate or provide funds.

*Comment (5):* The Service should consider whether the recovery criteria are achievable, because including unattainable recovery criteria could render such plans meaningless, or impede other processes under the Act.

*Response:* The National Marine Fisheries Service and U.S. Fish and Wildlife Service Interim Endangered and Threatened Species Recovery Plan Guidance (2010) emphasizes the development of recovery criteria that are specific, measurable, achievable, realistic, and time-referenced (SMART). The achievable component of SMART criteria implies that the authority, funding, and staffing needed to meet recovery criteria are feasible, even if not always likely.

In developing recovery criteria specifically, we attempt to establish criteria that are both scientifically defensible and achievable to the greatest extent possible. At times, however, the feasibility of achieving certain criteria can be, or appear to be, constrained by the particular, difficult circumstances that face a species. Even in such cases, criteria serve to guide recovery actions and priorities for the species. Furthermore, as recovery progresses, periodic reevaluation of the species status through the 5-year review process may reveal that the barriers to achieving certain criteria have been removed or that circumstances or our understanding of the species have

evolved. In that event, the Service can revise recovery criteria to ensure that they reflect the strategy most likely to succeed in the goal of recovery.

*Comment (6):* The Service should consider conservation efforts that have been put into place for the listed species since the previous iteration of the recovery plan, especially where the Service has supported conservation efforts, in formulating recovery criteria that will be established or amended by the revised draft plan.

*Response:* While section 4 of the Act directs the Service to specifically develop and implement recovery plans, several other sections of the Act and associated programs and activities also provide important opportunities to promote recovery. Information from these programs and activities about the biological needs of the species can inform recovery planning (including the formulation or revision of recovery criteria) and implementation. These conservation efforts have been considered during the development of this and other recovery plans.

*Comment (7):* The Service should determine whether ongoing species conservation efforts beneficially address one or more of the listing factors set forth in the Act implementing regulations addressing species listings and designation of critical habitat.

*Response:* All Service decisions that affect the listed status or critical habitat designation of a particular species, including our 5-year review of each listed species, are made by analyzing the five factors described in section 4 of the Act. Such an analysis necessarily includes an assessment of any conservation efforts or other actions that may mitigate or reduce impacts on the species. While our objective with this particular effort was to establish objective, measurable criteria for delisting, conservation actions play a crucial role in determining if and when those criteria have been satisfied.

*Comment (8):* The Service should be mindful of the impacts that recovery plan criteria can have on the section 7 process of the Act for the regulated community, because the Service and other Federal resource agencies sometimes request that recovery criteria be addressed in biological assessments and other planning processes under the Act addressing listed species.

*Response:* Recovery plans can both inform, and be informed by section 7 processes of the Act. When revising a recovery plan, existing section 7 consultations may provide helpful information on: recent threats and mechanisms to avoid, minimize, or compensate for impacts associated with those threats; a summarized status of the species; and indication of who important partners may be. Section 7 consultations can inform the need for revised recovery actions, recovery implementation schedule activities, recovery criteria, or species status assessments to provide more comprehensive recovery planning while the species remains listed.

*Comment (9):* The Service should include the full panoply of current information available for the species in all revised draft recovery plans.

*Response:* Our recovery planning guidance recommends that recovery planning be supported by compilation of available information that supports the best possible scientific understanding of the species. Although it is not necessary to exhaustively include all current information within the text of the recovery plan, to the extent that this information is specifically relevant and useful to

recovery, the recovery plan may summarize such material or incorporate it by reference. Supporting biological information may also be included within a species status assessment or biological report separate from the recovery plan document itself.

*Comment (10):* The Service should consider whether the existing recovery plan should be revised or replaced in its entirety rather than amended in part.

*Response:* Under guidance established in 2010, partial revisions allow the Service to efficiently and effectively update recovery plans with the latest science and information when a recovery plan may not warrant the time or resources required to undertake a full revision of the plan. To further gauge whether we had assembled, considered, and incorporated the best available scientific and commercial information into this recovery plan revision, we solicited submission of any information, during the public comment period, that would enhance the necessary understanding of the species' biology and threats, and recovery needs and related implementation issues or concerns. We believe the recovery plan amendment, which targets updating recovery criteria, is appropriate for the species. However, we will also continue to evaluate the accuracy and usefulness of the existing recovery plan with respect to current information and status of conservation actions, and may pursue a full revision of the plan in the future, if appropriate.

### **Summary of Peer Review Comments**

We solicited independent peer review between the draft and final amendment in accordance with the requirements of the Act from the State of Hawaii Division of Forestry and Wildlife, the U.S. Army, University of Hawaii, and The Nature Conservancy. Criteria used for selecting peer reviewers included their demonstrated expertise and specialized knowledge related to O'ahu tree snails, knowledge of the threats to the species and their habitat, and ecosystem management in Hawaii. The qualifications of the peer reviewers are in the decision file and the administrative record for this recovery plan amendment.

In total, we solicited review and comment from five peer reviewers and two partner agencies. We did not receive comments from any peer reviewers or partner reviewers.