

To: All Department of Fish and Wildlife Scientific Staff

Subject: Captive Propagation of Fish, Wildlife and Plants for Conservation
Purposes

POLICY STATEMENT

The Department of Fish and Wildlife (Department) may conduct or support captive propagation programs when they are designed consistent with the Department's Policy on Scientific Integrity and Guidelines for Animal Welfare, other established scientific standards, and as further described in this Bulletin.

I. Scope

This Bulletin provides guidance to Department staff in conducting, evaluating, and conditioning proposed or existing captive propagation programs. It clarifies the application and implementation of captive propagation programs, and provides direction on the establishment of new captive populations including those intended for educational purposes. It does not address commercial propagation or stock enhancement programs pursuant to existing regulations or policies such as Fish and Game Code sections 6591, 15001, 15300, and California code of regulations Title 14, section 243, and does not affect existing programs for the propagation of listed anadromous salmonids, nor existing hatchery management programs. It does apply to the sale of wildlife pursuant to Fish and Game Code section 15301.

II. Discussion

The Department is committed to employing the best scientific and conservation practices to maintain wild populations of plants, animals, and their habitats for their intrinsic value, ecological functions, and for the public's use and enjoyment. Consistent with this commitment, management and regulatory actions including captive and other managed propagation of plants and animals are undertaken or permitted by the Department for the benefit of those organisms and their habitats.

The Department may conduct or support captive propagation (captive propagation is explained in Attachment A) programs when they are designed consistent with the Department's Policy on Scientific Integrity and Guidelines for Animal Welfare, and other established scientific standards (see Attachments A and B); and are part of a

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management or recovery plan for species listed under either the State or Federal Endangered Species Acts (listed species); or are intended and expected to substantially increase the survival of non-listed or listed species; or substantially contribute to scientific or educational activities; or are part of emergency actions for species (or distinct population segments) under imminent threat of extinction.

The Department does not generally support the establishment or augmentation of captive populations of listed species with individuals obtained from the wild for the sole purpose of exhibition. However, the Department might support exhibition of individual animals and plants that are determined by the Department to be unlikely of surviving in the wild. In addition, members of captive populations maintained for conservation or scientific purposes may be exhibited according to conditions of the applicable permits and management plans including contingency plans for the disposition (e.g., release, reassignment or euthanasia) of captive bred animals which avoid impacts to wild populations.

Attachment A provides further discussion and background on this topic. Attachment B provides direction on how to implement this guidance.

Signed original on file.

Kevin W. Hunting
Chief Deputy Director

Attachments: A. Discussion
B. Implementation

ATTACHMENT A. Discussion

Managed propagation encompasses a wide range of management actions intended to increase the populations of fish, wildlife, or plants. Often this is through the facilitation of natural means of reproduction, but in some cases it is through assisted or “artificial” propagation, such as cross-fostering, intra- and extra-specific embryo transfer, in-vitro fertilization, assisted pollination, and cloning. These management actions may occur along a gradient from in the wild (“*in situ*”) to complete captivity (“*ex situ*”). The guidance in this Bulletin concerns the establishment and use of captive (*ex situ*) populations of plants and animals, and those maintained in highly constrained outdoor settings, which are essentially captive. However, the larger scope is discussed for context, and because many of the same principles apply.

Commonly, managed propagation includes the take and manipulation of fish, wildlife, plants, gametes, propagules, and reproductively viable plant parts from the wild, or their collection from already-captive individuals, for:

- Captive (*ex situ*) breeding and/or rearing with reintroduction as a primary objective;
- Wild (*in situ*) breeding and/or rearing, with support of existing populations as a primary goal;
- Maintenance of populations of at-risk or listed (e.g., threatened, endangered, etc.) species in captivity as insurance against extirpation in the wild, with reintroduction and species recovery as primary objectives, recognizing that in some circumstances, this may be a remote possibility;
- Conservation of seeds, gametes, or germ plasm in repositories for future use; and
- Scientific, management and/or educational purposes, where those purposes include advancing scientific knowledge or meeting specific conservation or management goals, conservation, recovery, or protection of wildlife, fish, and plants.

Managed propagation actions can be considered along a continuum, based on the degree and duration of captivity. With the additional consideration of conservation goals, these actions may be grouped as presented below, in an order of lesser to greater intensity:

- Organisms are husbanded in some manner in the wild specifically to enhance propagation/recruitment:
 - They may be free- ranging or, for plants and sessile animals, in naturally occurring locations; or
 - Intentionally restricted in movement or protected from predators or other threats under otherwise largely natural conditions in locations where they naturally occur; or

- Translocated from one site to another, to establish either free-ranging or restricted/protected populations.
- Organisms are taken from the wild into captivity and:
 - Held for some limited time without reproduction in captivity, and the same individuals released back into the wild (e.g., Carmel River juvenile steelhead collection and rearing program, southwestern pond turtle head start program, desert tortoise disease treatment in captivity program). This is considered propagation in the sense that it increases individuals' chances of successfully surviving, reproducing, and increasing the wild population;
 - Offspring are produced in captivity, and the offspring are released into the wild, but no captive population is maintained (e.g., Chinook salmon program, collection of bird eggs which are hatched and released);
 - Offspring are released into the wild, and a captive population is maintained (e.g., production of rare plant seeds and seedlings for restoration and enhancement in the wild, and storage and/or maintenance in a living garden and/or seed storage repository; southern mountain yellow legged frog captive breeding programs; Pacific pocket mouse (San Diego Zoo) and Amargosa vole (UC Davis) conservation programs;
 - There is no release into the wild (e.g., conservation seed banking; Delta smelt “insurance populations” maintained in hatcheries; some animals which are too injured or habituated to humans to survive in the wild; organisms intended to augment or establish captive populations for research or education).
- Existing captive populations or genetic material (that is, the proposed program does not include new collections from the wild), are used to propagate the species in captivity, and:
 - Progeny or founders are not released to the wild (i.e., maintaining captive populations)
 - Progeny or founders are released to the wild.

Critical Considerations Related to the Use of Captive Populations for Conservation Purposes

The broad questions related to taking animals or plants out of the wild to establish managed populations are, in general: under what conditions and using what techniques should this happen; and under what conditions and techniques should they be released back into the wild.

A number of underlying principles are generally common across managed propagation programs. While it is not possible to provide fully prescriptive guidance that would cover all considerations for any one program there are several factors that are critical to consider early in the planning stages. These include:

- What is the need for a conservation intervention for the species under consideration?
- How does managed propagation fit into the overall strategy to manage or recover a species?
- Are there adequate management plans, including genetics, disease, animal welfare, criteria for release, release plans, contingency plans for captive or managed populations, etc.?
- Are there resources to conduct the action, and how does allocation of resources to the proposed action affect other programs?
- If all or substantial portions of a species are contemplated to be taken into captivity, does the risk justify this measure?

If a decision is made to establish or continue a captive propagation action, additional considerations are important in the development of that action. Key among these is the preparation of a plan that defines the actions necessary to achieve the stated conservation goals. Actions should be specific, measurable, have time schedules attached, and indicate the resources needed and parties responsible for their implementation.

When considering species at higher risk, actions that have not been implemented successfully in the same or similar species, or actions that rely on establishing and maintaining captive populations, the Department must carefully weigh potential benefits against risks in each situation. For example, current captive “head-start” programs for southwestern pond turtles (in which young turtles are captured in the wild and raised in captivity until large enough to avoid high predation rates, then released into suitable habitats within the source metapopulation), incorporate extensive field surveys, predator and habitat management, screening for disease, and consideration of metapopulation genetics. This is a low risk, high gain scenario, and investment in facilities, staff, and infrastructure by the Department is relatively low. The reintroduction of extirpated spring run Chinook salmon to the San Joaquin River poses significant issues related to founder stock genetics, habitat suitability, potential risks to donor populations, and needs for long-term management. This moderate-risk, high-gain scenario is supported by ongoing monitoring and the maintenance of captive populations of founding genetic lines. The history of the California condor, Mexican wolf, and black-footed ferret recovery actions illustrate some of the challenges of high-risk, high gain programs in the United States.

The best current guidance on these and related questions is published by the International Union for the Conservation of Nature (IUCN) Species Survival Commission: [Guidelines on the Use of Ex Situ Management for Species Conservation](#). Version 2.0., 2014; and [Guidelines for Reintroductions and Other Conservation Translocations](#), June 2013. Department staff should consult the most recent versions of these Guidelines carefully, as well as technical literature and species experts when planning the use of captive populations for conservation purposes.

ATTACHMENT B. Implementation

Captive propagation activities conducted, supported, or required by the Department could be related to:

1. Department, other agency, or conservation partner management or conservation plans for plants, animals or ecological communities;
2. State or federal recovery plans for listed species;
3. Use of captive bred or reared animals or plants to address scientific questions, support educational opportunities, or augment wild populations;
4. Responses to prevent or offset catastrophic losses from natural or human-caused disasters and emergencies;
5. Adaptations to climate change; and
6. Genetic banking, or “insurance” against extinction of a species that are at high risk of extinction threatened in the wild.

Initial Assessment and Approvals

Some existing Department programs, such as the Habitat Conservation Planning Branch’s Native Plant Program, routinely issue numerous authorizations for captive propagation. Such programs may be exempted from the following requirements, if they document that they address the key elements identified in this Bulletin, and the exemption is approved by the Chief Deputy Director.

When aware of the potential need to take action involving captive propagation to assist recovery or avert extirpation or extinction of a species, the originating sector of the Department (Regions, or Wildlife, Fisheries or Habitat Conservation Branches), shall:

1. Assemble a team including staff from the involved Region(s) and Branch(es) to recommend appropriate action, including a review and support team from the Department’s Science Institute.
2. Maintain coordination within the Department’s technical staff and management.
3. Prepare an initial written summary of the situation to present to the Department management (Regional Manager and Branch Chief) to obtain approval to proceed to develop the proposed action. In emergencies, this will be brief and rapid, with after-the-fact development of complete plans as soon as feasible.
4. Engage with other resource agencies that may have jurisdiction or interest, external species experts, academic and zoological institutions that might participate, and affected stakeholders.
5. Prepare an assessment of the need, risks, and other planning elements. The Department may proceed upon the joint approval of the involved Branch and Region and concurrence of the affected Deputy Director(s) if, overall, the conservation benefits to the species at risk outweigh the possible adverse impacts of the program. Approval for such a program shall be documented by signature blocks on the plan, or by memos from the involved Branch Chief(s), Regional Manager(s) and Deputy Director (s). These actions might require CEQA review, but may be exempt as class 7 or 8 actions.

6. To facilitate efficiency and communication, Department may develop and employ an Incident Command System (ICS) for coordination and communications. The ICS can include experts outside of the Department (e.g. Federal agencies) and stakeholders).

Plan Preparation and Evaluation

In preparing and/or evaluating a proposal to facilitate propagation, Department staff shall follow the most current IUCN Guidelines (see Attachment A). The rigor of the proposal should be in proportion to the level of risks to the species involved. Planning for species facing greater risks of extinction or extirpation should receive greater effort, because the consequences of failure could be very high. The evaluation steps are summarized below:

1. Fully document the conservation status of the species, including the presenting threats. Ideally, a detailed review should be undertaken of all relevant information on the species, both in the wild and in captivity, with the aim of assessing the overall ecological status, population trend and viability, and to identify and understand threats that affect the species. A threat analysis should be undertaken to identify the specific historical, current, and likely future primary direct and indirect threats as well as stochastic threats facing the species in the wild and the constraints limiting its viability and conservation.
2. Define the role(s) that captive propagation will play in the overall conservation of the species. The management strategies proposed should address one or more specific threats or constraints to the species' viability and conservation as identified in the status review and threat analysis, and target improvement of its conservation status. There should be a clear statement on how the proposed program will contribute quantifiable benefits to the conservation of the species and address certain specific threat(s) and/or constraints to its viability as identified in the status review and threat analysis. In general, the effects of these interventions fall into the following categories: addressing the causes of primary threats, offsetting the effects of threats, buying time until recovery actions can take place, and restoring wild populations.
3. Determine the characteristics and dimensions of the captive population and action needed to fulfill the identified conservation role(s). These include items such as the number of founders required to attain the genetic and demographic goals of the population; the number of individuals or bio-samples to be maintained or produced in captivity; the duration of the program; risks of artificial selection/adaptation; and conditions for release into the wild for captive populations.
4. Define the resources and expertise needed for the captive management program to meet its role(s) and appraise the feasibility and risks. These include: necessary facilities and staff; risks for spread of disease; monitoring; risk and response to catastrophes (natural or human-caused catastrophes, such as fire,

accidental release, loss of funding, etc.); and fiscal resources required for all essential activities for a period of time adequate to determine if the program has achieved its goals.

5. Make a decision that is informed by the above-described analyses, transparent, and well-documented. The decision should consider the relative importance of potential conservation benefit vs. likelihood of success. Costs and risks will vary for each species and situation, according to factors such as, but not limited to: the severity of threats and/or risk of extinction of the wild population; the significance of the species (ecological, cultural, sociological, economic or evolutionary distinctness, value of the species in leveraging large scale habitat conservation, etc.); and legal and political mandates.
6. Final approval to conduct an action requires written approval from the involved Branch Chiefs, Regional Managers, and Deputy Directors. This shall be documented by signature blocks on the plan, memos, or other processes as determined by the Department.
7. Monitoring, adjustment, and evaluation. The plan must include scheduled evaluations of the action, at least annually, not only of its own success, but also of its role within the overall conservation strategy for the species, which is likely to change over time. This evaluation should include measures to terminate the program if successful, or alter it if not. These reports are to be circulated to and reviewed by the project team, approving officials (Branch Chiefs, Regional Managers, and Deputy Directors) and the Science Institute support team. The approving officials should report their determinations and provide direction in a timely manner.

Examples:

The following references provide examples of plans for captive propagation developed by the Department and collaborators:

Ernest, H.2001. "Captive Breeding Contingency Plan: A Guide for Captive Breeding of Sierra Nevada Bighorn Sheep". UC Davis Wildlife Health Center.

Elliott, J. 2004. Lahontan Cutthroat Trout Species Management Plan for the Upper Humboldt River Drainage Basin. Nevada Department of Wildlife.

Hitchcock, C.J., A.R. Backlin, and R. N. Fisher. 2007. "Using Experimental Translocation as a last resort for the recovery of the Mountain Yellow-legged Frog (*Rana mucosa*) in Southern California". U. S. Geological Survey, Western Ecological Research Center, San Diego.

Foley, J. and D. L. Clifford. 2014. "Captive Propagation and Introduction Plan for the Amargosa Vole (*Microtus californicus scirpensis*)". California Department of Fish and Wildlife, University of California.

U.S. Fish and Wildlife Service. 2011. "Intra-Service formal section 7 consultation on the amendment of a 10(a)(1)(A) permit for captive breeding and reintroduction/population augmentation of the southern California distinct population segment of the mountain yellow-legged frog".