Summary

AFS Policy Statement #19:
Guidelines for Introduction of Threatened and Endangered Fishes
(Abbreviated)

1. Selecting the Introduction Site
2. Conducting the Introduction
3. Post-Introduction Activities

Introduction of threatened and endangered fishes often is an integral feature of recovery programs. More than 80% of threatened and endangered fishery recovery plans call for introductions to establish new populations or educational exhibits, supplement existing populations, or begin artificial propagation. Some introductions have been inadequately planned or poorly implemented. As a result, introductions of some rare fishes have been successful, whereas recovery for others has progressed slowly. In at least one instance, the introduced fish eliminated a population of another rare native organism. Additional problems can arise when genetic or phenotypic changes occur in introduced stock as a result of relocating a species into habitat that differs greatly from the species' natural habitat.

The AFS policy regarding introduction of threatened and endangered fishes is divided into three components: (1) selecting the introduction site, (2) conducting the introduction, and (3) post-introduction activities.

1. Selecting the Introduction Site

• Restrict introductions to within the native or historic habitat whenever possible. Historic habitat of a species is herein considered to be those localities in which the species is known plus any interconnected waters in which it could reasonably have occurred. Introductions outside of a species' historic habitat may be necessary, but should be considered only when all locations within the historic range are unsuitable or unrestorable, when extant historical habitat is clearly threatened with imminent loss, or when the introduction is proposed within a controlled site (such as a hatchery).

• Restrict introductions to a protected site, secure from imminent or future threats of habitat destruction. Some form of management agreement with the landowner or land management agency is advisable.

• Restrict introductions to sites where the potential for dispersal has been determined and is acceptable.

• Restrict introductions to sites that fulfill life history requirements of the species. Habitat variables and water quality should be analyzed to determine that they are similar to that observed in an undisturbed natural habitat.

• Restrict introductions to sites that contain sufficient habitat to support a viable population. To maintain population viability, sufficient individuals must be present to prevent serious inbreeding and loss of genetic variation by random drift.

• Prohibit introductions into areas where the endangered or threatened fish could hybridize with other species or subspecies.

• Prohibit introductions into areas where other rare or endemic taxa could be adversely affected.

2. Conducting the Introduction

Summary

• Choose introduction stock from appropriate sources. It is important to realize that each isolated population of a rare fish is likely to be a unique gene pool with specific adaptations to local conditions. Selection criteria will vary with the intended purpose of the introduction, but consideration may be given to selecting the most genetically pure stock, the rarest stock, the stock closest geographically to the introduction site, or the stock closest ecologically. Mixing of naturally isolated stocks to establish a population should be discouraged because it may reduce genetic fitness by loss of closely-linked or coadapted genes.

• Examine the taxonomic status of introduction stock. Prior to transport an appropriate taxonomist should examine the stock to insure that only the desired form is present. If the taxonomy is questionable but the stocking proceeds, a subsample of the stock should be preserved for future analysis.

• Examine introduction stock for presence of undesirable pathogens. Prior to shipment a qualified fish pathologist should examine the stock for parasites and disease. Ideally, the sample should be quarantined for at least two weeks so that parasites may complete their life cycle or become numerous enough to detect.

• Obtain introduction stock of sufficient number and character. An introduced population should be founded with enough individuals to adequately reflect the genetic composition, age and sex ratio present in the source population.

• Carefully and quickly transport stock. An adequate recovery period should be provided between each stressful event in the capture and stocking process.

• Introduce stock under most favorable conditions. These conditions, varying by species, include weather, hydrologic conditions, water temperature, and time of day.

• Document the translocation. Introduction data should be made available through regularly distributed scientific literature, or though administrative reports of the lead agency. At a minimum records should include (a) names of participants, (b) taxon involved, (c) source of the introduction sample, (d) numbers, sex, and age or size distribution, (e) date of introduction, and (f) precise location of receiving habitat.

3. Post-Introduction Activities

• Conduct systematic monitoring of introduced populations to determine initial survival, recruitment of young, and persistence through environmental stochasticity (such as floods, drought, or fire). Quarterly monitoring may be necessary at first, followed by annual monitoring for many years to determine long-term survivorship.

• Restock if warranted. Supplemental stocking may be necessary to facilitate establishment or increase gene flow. Supplemental stock should be collected from the same source as the original introduction in order to maintain genetic fitness.

• Determine cause of failures. Understanding failed introductions ultimately may be more important in promoting recovery than certain successes.

• Document findings and conclusions reached during the post-introduction process. This information should be made available in the scientific literature or administrative reports and widely distributed.