

*Inventory (TRI) Surface Water Releases and Transfers to POTWs*, March 13, 1995.

(5) Letter of February 2, 1995 to Carol M. Browner, Administrator U.S. EPA from Dr. Genevieve Matanoski, Chair, Executive Committee, Science Advisory Board.

## IX. Regulatory Assessment Requirements

### A. Executive Order 12866

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether the regulatory action is "significant" and therefore subject to review by the Office of Management and Budget (OMB) and the requirements of the Executive Order. Under section 3(f), the order defines a "significant regulatory action" as an action likely to lead to a rule (1) Having an annual effect on the economy of \$100 million or more, or adversely and materially affecting a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities (also referred to as "economically significant"); (2) creating serious inconsistency or otherwise interfering with an action taken or planned by another agency; (3) materially altering the budgetary impacts of entitlements, grants, user fees, or loan programs; or (4) raising novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order. Pursuant to the terms of this Executive Order, it has been determined that this amended proposed rule is not "significant" and therefore not subject to OMB review.

### B. Regulatory Flexibility Act

Under the Regulatory Flexibility Act of 1980, the Agency must conduct a small business analysis to determine whether a substantial number of small entities would be significantly affected by a proposed rule. Because the amended proposed rule does not create any new requirements and consolidates other requirements, it would not significantly affect facilities, including small entities.

### C. Paperwork Reduction Act

This amended proposed rule does not result in any new information collection requirements subject to the provisions of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

### List of Subjects in 40 CFR Part 372

Environmental protection, Chemicals, Community right-to-know, Reporting

and recordkeeping requirements, and Toxic chemicals.

Dated: March 29, 1995.

**Susan H. Wayland,**

*Acting Assistant Administrator, Office of Prevention, Pesticides and Toxic Substances.*

Therefore it is proposed that, 40 CFR part 372 be amended as follows:

### PART 372—[AMENDED]

1. The authority citation for part 372 would continue to read as follows:

Authority: 42 U.S.C. 11023 and 11048.

#### § 372.65 [Amended]

2. Sections 372.65(a) and (b) are amended by removing the entire entry for ammonium sulfate (solution) and ammonium nitrate (solution) and by adding the following language to the ammonia listing "includes anhydrous ammonia and aqueous ammonia from water dissociable ammonium salts and other sources; 10 percent of total aqueous ammonia is reportable under this listing" under paragraph (a) and removing the entire CAS No. entry for 7783-20-2 and 6484-52-2 under paragraph (b).

[FR Doc. 95-8202 Filed 3-30-95; 1:29 pm]

BILLING CODE 6560-50-F

## FEDERAL COMMUNICATIONS COMMISSION

### 47 CFR Part 73

[MM Docket No. 94-67; RM-8481]

### Radio Broadcasting Services; Collegetown, MN

AGENCY: Federal Communications Commission.

ACTION: Proposed rule; dismissal.

**SUMMARY:** This document dismissed a petition for rule making filed by Saint John's University requesting the allotment of Channel 260A to Collegetown, Minnesota, and reservation of the channel for noncommercial educational use. See 59 FR 35292, July 11, 1994. In reviewing this proceeding, we discovered that we erroneously proposed reservation of the channel at Collegetown. The Notice should only have proposed allotment of a channel to Collegetown. Saint John's proposal does not meet the established guidelines to reserve a channel in the commercial band. Since no comments were received expressing an intention to use the channel as a commercial station, we have terminated the proceeding without making an allotment. With this action, this proceeding is terminated.

**FOR FURTHER INFORMATION CONTACT:** Kathleen Scheuerle, Mass Media Bureau, (202) 418-2180.

**SUPPLEMENTARY INFORMATION:** This is a summary of the Commission's *Report and Order*, MM Docket No. 94-67, adopted March 16, 1995, and released March 28, 1995. The full text of this Commission decision is available for inspection and copying during normal business hours in the Commission's Reference Center (Room 239), 1919 M Street, NW, Washington, D.C. The complete text of this decision may also be purchased from the Commission's copy contractors, International Transcription Services, Inc., 2100 M Street, NW, Suite 140, Washington, D.C. 20037, (202) 857-3800.

### List of Subjects in 47 CFR Part 73

Radio broadcasting.

**Authority:** Secs. 303, 48 Stat., as amended, 1082; 47 U.S.C. 154, as amended. Federal Communications Commission.

**John A. Karousos,**

*Chief, Allocations Branch, Policy and Rules Division, Mass Media Bureau.*

[FR Doc. 95-7947 Filed 3-31-95; 8:45 am]

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## DEPARTMENT OF THE INTERIOR

### Fish and Wildlife Service

### 50 CFR Part 17

RIN 1018-AD11

### Endangered and Threatened Wildlife and Plants: Proposal To Determine Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule and notice of petition findings.

**SUMMARY:** The U.S. Fish and Wildlife Service (Service) proposes endangered status pursuant to the Endangered Species Act (Act) of 1973, as amended, for two plants, *Spiranthes delitescens* (Canelo Hills ladies'-tresses) and *Lilaeopsis schaffneriana* spp. *recurva* (Huachuca water umbel), and one amphibian, the Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*). These species occur in a limited number of wetland habitats in southern Arizona and northern Sonora, Mexico. They are threatened by one or more of the following—collecting, disease, predation, competition with nonnative species, catastrophic floods, drought, and degradation and destruction of

habitat resulting from livestock overgrazing, water diversions, dredging, and groundwater pumping. All three taxa are also threatened with stochastic extirpations or extinction due to small numbers of populations or individuals. This proposed rule, if made final, would extend the Act's protection to these three taxa.

**DATES:** Comments from all interested parties must be received by June 2, 1995. Public hearing requests must be received by May 18, 1995.

**ADDRESSES:** Comments and materials should be sent to the Arizona Ecological Services State Office, U.S. Fish and Wildlife Service, 3616 West Thomas Road, Suite 6, Phoenix, Arizona 85019. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

**FOR FURTHER INFORMATION CONTACT:** Jim Rorabaugh at the above address (telephone 602/640-2720; facsimile 602/379-6629).

#### SUPPLEMENTARY INFORMATION:

##### Background

Cienegas are mid-elevation wetland communities often surrounded by relatively arid environments. They are typically associated with permanent perennial springs and stream headwaters, have permanently or seasonally saturated highly organic soils, and have a low probability of flooding or scouring (Hendrickson and Minckley 1984). Cienegas support diverse assemblages of animals and plants, including many species of limited distribution, such as the three taxa in this proposed rule (Hendrickson and Minckley 1984, Lowe 1985, Minckley and Brown 1982, Ohmart and Anderson 1982). Although *Spiranthes delitescens* (*Spiranthes*), *Lilaeopsis schaffneriana* ssp. *recurva* (*Lilaeopsis*), and Sonora tiger salamander typically occupy different microhabitats, they all occur in cienegas: *Lilaeopsis* also occurs along streams and rivers.

Cienegas and perennial streams and rivers in the desert southwest are extremely rare. The Arizona Game and Fish Department (1993) recently estimated that riparian vegetation associated with perennial streams comprises about 0.4 percent of the total Arizona land area, with present riparian areas being remnants of what once existed. The State of Arizona (1990) estimates that up to 90 percent of the riparian habitat along Arizona's major desert watercourses has been lost, degraded, or altered in historic times. *Spiranthes*, *Lilaeopsis*, and the Sonora

tiger salamander occupy small portions of these rare habitats.

*Spiranthes delitescens* (*Canelo Hills Ladies'-tresses*). *Spiranthes delitescens* is a slender, erect, terrestrial orchid that when in bloom reaches approximately 50 centimeters (cm) 20 inches (in) tall. Five to ten, linear-lanceolate, grass-like leaves, 18 cm (7.1 in) long and 1.5 cm (0.6 in) wide, grow basally on the stem. The fleshy swollen roots are approximately 5 millimeters (mm) (0.2 in) in diameter. The top of the flower stalk contains up to 40 small white flowers arranged in a spiral. The species is presumed to be perennial, but mature plants rarely flower in consecutive years and in some years have no visible aboveground structures (McClaran and Sundt 1992, Newman 1991).

P.S. Martin first collected *Spiranthes delitescens* in 1968 at a site in Santa Cruz County, Arizona (Sheviak 1990). This specimen was first identified as *Spiranthes graminea*, a related Mexican species. Sheviak (1990) found that the *Spiranthes* in Arizona, previously thought to be *S. graminea*, displayed a distinct set of morphological and cytological characteristics and named them *S. delitescens*.

This species is known from four cienegas at about 1,525 meters (m) (5,000 feet (ft)) elevation in the San Pedro River watershed in Santa Cruz and Cochise Counties, southern Arizona (Newman 1991). The total amount of occupied habitat is less than 81 hectares (ha) (200 acres (ac)). All populations are on private land less than 37 kilometers (km) (23 miles (mi)) north of the U.S./Mexico border.

Potential habitat in Sonora, Mexico, has been surveyed, but no *Spiranthes* populations have been found.

The dominant vegetation associated with *Spiranthes* includes grasses. *Carex* spp. (sedges), *Juncus* spp. (rushes), *Eleocharis* spp. (spike rushes), *Typha* spp. (cattails), and *Equisetum* spp. (horsetails) (Cross 1991, Warren *et al.* 1991). The surrounding vegetation is semidesert grassland or oak savannah.

All *Spiranthes* populations occur where scouring floods are very unlikely (Newman 1991). Soils supporting the populations are finely grained, highly organic, and seasonally or perennially saturated. Springs are the primary water source, but a creek near one population contributes near-surface groundwater (McClaran and Sundt 1992).

Some *Spiranthes* life history information has been gained from studies at one site. As with most terrestrial orchids, successful seedling establishment probably depends on the formation of endomycorrhizae (a symbiotic association between plant

root tissue and fungi) (McClaran and Sundt 1992). The time needed for subterranean structures to produce aboveground growth is unknown. Plants may remain dormant in a subterranean state or remain vegetative (nonflowering) for more than one consecutive year. Plants that flower one year can be dormant, vegetative, or reproductive the next (McClaran and Sundt 1992, Newman 1991). The saprophytic/autotrophic state of orchid plants may be determined by climatic fluctuations and edaphic factors such as pH level, temperature and soil moisture (Sheviak 1990).

Estimating *Spiranthes* population size and stability is difficult because nonflowering plants are very hard to find in the dense vegetation, and yearly counts underestimate the population because dormant plants are not counted. McClaran and Sundt (1992) monitored marked individuals in a *Spiranthes* population during two three-year periods. They concluded that the subpopulations at both monitored sites were stable between 1987 and 1989, although Newman (1991) later reported that one monitored site was reduced to one nonflowering plant in 1991. Due to the propensity of *Spiranthes* plants to enter and remain in a vegetative state and the lack of new flowering plants at one monitoring site. McClaran and Sundt (1992) also speculated that population numbers may be declining. Problems of experimental design acknowledged by the authors confounded McClaran and Sundt's (1992) conclusions about population stability; the Service believes additional long-term studies are needed to more accurately determine the stability of *Spiranthes* populations.

The fire ecology of this *Spiranthes* is unknown, but should be determined. Experts disagree about the role of fire in cienegas. Some believe upland lightning-caused fires spread into cienegas and burn at cool temperatures while others believe the wet, marsh-like habitats will not support fires. Determining the best method of managing healthy cienegas will depend, in part, on resolving this controversy. Studies at one site have been inconclusive about the effect of fires on *Spiranthes* (Gori and Fishbein 1991, Fishbein and Gori 1992).

*Lilaeopsis schaffneriana* ssp. *recurva* (*Huachuca water umbel*). *Lilaeopsis schaffneriana* ssp. *recurva* is an herbaceous, semi-aquatic, perennial plant with slender, erect leaves that grow from creeping rhizomes. The leaves are cylindrical, hollow, and have septa (thin partitions) at regular intervals. The yellow-green or bright

green leaves are generally 1–3 mm (0.04–0.12 in) in diameter and often 3–5 cm tall (1–2 in), but can reach up to 20 cm (8 in) tall under favorable conditions. Three to ten very small flowers are born on an umbel that is always shorter than the leaves. The fruits are globose, 1.5–2 mm (0.06–0.08 in) in diameter, and usually slightly longer than wide (Affolter 1985). The species reproduces sexually and from rhizomes asexually, the latter probably being the primary reproductive mode.

*Lilaeopsis schaffneriana* ssp. *recurva* was first described by A.W. Hill, based on the type specimen collected near Tucson in 1881 (Hill 1926). Hill applied the name *Lilaeopsis recurva* to the specimen, and the name prevailed until Affolter (1985) revised the genus. Affolter applied the name *L. schaffneriana* ssp. *recurva* to plants found west of the continental divide.

*Lilaeopsis* has been documented from 21 sites in Santa Cruz and Cochise Counties, Arizona, and in adjacent Sonora, Mexico, west of the continental divide (Saucedo 1990, Warren *et al.* 1989, Warren *et al.* 1991, Warren and Reichenbacher 1991). Six of the 21 sites have been extirpated. The 15 extant sites occur in four major watersheds—San Pedro River, Santa Cruz River, Rio Yaqui, and Rio Sonora. All sites are between 1,148 and 2,133 m (3,500 and 6,500 ft) elevation.

Eight *Lilaeopsis* populations occur in the San Pedro River watershed in Arizona and Sonora, on sites owned or managed by private landowners, the Fort Huachuca Military Reservation, the Coronado National Forest, and the Bureau of Land Management (BLM)—Safford District. Two extirpated populations in the upper San Pedro watershed in Arizona occurred at Zinn Pond in St. David and the San Pedro River near St. David. Cienega-like habitats suitable for *Lilaeopsis* were probably common along the San Pedro River prior to 1900 (Hendrickson and Minckley 1984, Jackson *et al.* 1987), but these habitats are now largely gone.

The four *Lilaeopsis* populations in the Santa Cruz River watershed probably represent very small remnants of larger populations that may have occurred in the extensive riparian and aquatic habitat formerly along the river. Before 1890, the spatially intermittent, perennial flows on the middle Santa Cruz River most likely provided a considerable amount of habitat for *Lilaeopsis* and other aquatic plants. The middle section of the Santa Cruz River mainstem, about a 130–km (80–mi) reach, flowed perennially from the U.S./Mexico border north to the Tubac area then intermittently from Tubac north to

the Tucson area (Davis 1986). In 1859, a traveler described the Santa Cruz River in the Tucson area as a “\* \* \* rapid brook \* \* \* clear as crystal, and full of aquatic plants, fish and tortoises of various kinds \* \* \*” (in Humphrey 1958). This habitat and species assemblage no longer occurs in the Tucson area. A population at Monkey Spring in the upper watershed of the middle Santa Cruz River has been extirpated, although suitable habitat still exists (Warren *et al.* 1991).

Two *Lilaeopsis* populations occur in the Rio Yaqui watershed. The species was recently discovered at Presa Cuquiarichí, in the Sierra de los Ajos, several miles east of Cananea, Sonora (Deecken, pers. comm. 1994). The species remains in small areas (generally less than 1 square meter (m<sup>2</sup>)) in Black Draw, Cochise County, Arizona. Transplants from Black Draw have been successfully established in nearby wetlands and ponds. Recent renovation of House Pond on private land near Black Draw extirpated the *Lilaeopsis* population. A population in the Rio San Bernardino in Sonora was also recently extirpated (Gori *et al.* 1990). One *Lilaeopsis* population occurs in the Rio Sonora watershed at Ojo de Agua, a cienega in Sonora at the headwaters of the river (Saucedo 1990).

*Lilaeopsis* has an opportunistic strategy that ensures its survival in healthy riverine systems, cienegas, and springs. In upper watersheds that generally do not have scouring floods, *Lilaeopsis* occurs in microsites where interspecific plant competition is low. At these sites, *Lilaeopsis* occurs on wetted soils interspersed with other plants at low density, along the periphery of the wetted channel, or in small openings in the understory. The upper Santa Cruz River and associated springs in the San Rafael Valley, where a population of *Lilaeopsis* occurs, is an example of a site that meets these conditions. The types of microsites required by *Lilaeopsis* were generally lost from the main stems of the San Pedro and Santa Cruz rivers when channel entrenchment occurred in the late 1800s.

In stream and river main channels, *Lilaeopsis* can occur in backwaters, side channels, and nearby springs. After a flood, *Lilaeopsis* can rapidly expand its population and occupy disturbed habitat until interspecific competition exceeds its tolerance. This response was observed at Sonoita Creek in August 1988, when a scouring flood removed about 95 percent of the *Lilaeopsis* population (Gori *et al.* 1990). One year later, *Lilaeopsis* had recolonized the stream and was again codominant with

*Rorippa nasturtium-aquaticum* (watercress) (Warren *et al.* 1991). The expansion and contraction of *Lilaeopsis* populations appears to depend on the presence of “refugia” where the species can escape the effects of scouring floods, a watershed with an unaltered hydrograph, and a healthy riparian community that stabilizes the channel.

Density of *Lilaeopsis* plants and size of populations fluctuates in response to both flood cycles and site characteristics. Some sites, such as Black Draw, have a few sparsely distributed clones, possibly due to the dense shade of the even-aged overstory trees and deeply entrenched channel. The Sonoita Creek population occupies 14.5 percent of a 500.5 m<sup>2</sup> (5,385 ft<sup>2</sup>) patch of habitat (Gori *et al.* 1990). Some populations are as small as 1–2 m<sup>2</sup> (11–22 ft<sup>2</sup>). The Scotia Canyon population, by contrast, has dense mats of leaves. Scotia Canyon contains the largest *Lilaeopsis* population, occupying about 57 percent of the 1,450 m (4,756 ft) perennial stream reach (Gori *et al.* 1990, J. Abbott, Forest Supervisor, Coronado National Forest, *in litt.* 1994). The Coronado National Forest plans to continue monitoring the populations in Scotia and Bear canyons.

While the extent of occupied habitat can be estimated, it is impossible to determine the number of individuals in each population because of the intermeshing creeping rhizomes. A population of *Lilaeopsis* may be composed of one or many genetically distinct individuals.

Introduction of *Lilaeopsis* into ponds on the San Bernardino National Wildlife Refuge (Refuge) appears to have been successful (Warren 1991). In 1991, *Lilaeopsis* was transplanted from Black Draw into new ponds and other Refuge wetlands. Transplants placed in areas with low plant density expanded rapidly (Warren 1991). In 1992, *Lilaeopsis* naturally colonized a pond created in 1991. However, as plant competition increased around the perimeter of the pond, the *Lilaeopsis* population decreased. This response seems to confirm observations (K. Cobble, San Bernardino National Wildlife Refuge, pers. comm. 1994, and P. Warren, pers. comm. 1993) that other species such as *Typha* sp. (cattails) will outcompete *Lilaeopsis*.

Other reintroductions are being considered. The Service has funded a project to reintroduce *Lilaeopsis* on the Santa Cruz River and tributaries, and the BLM (1993) plans to re-establish it along the San Pedro River.

Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*). The Sonora tiger salamander is a large salamander with

light-colored blotches or reticulation on a dark background. Snout-vent lengths of metamorphosed individuals range from approximately 6.7–12.5 cm (2.6–4.9 in) (Jones *et al.* 1988, Lowe 1954). Larval salamanders are aquatic with plume-like gills and well developed tail fins (Behler and King 1980). Larvae hatched in the spring are large enough to metamorphose into terrestrial salamanders from late July to early September, but only an estimated 17–40 percent metamorphose annually. Remaining larvae mature into branchiataes (aquatic and larval-like, but sexually mature salamanders that remain in the breeding pond) or overwinter as larvae (Collins and Jones 1987); James Collins, Arizona State University, pers. comm. 1993).

The Sonora tiger salamander was discovered in 1949 at the J.F. Jones Ranch stock tank in Parker Canyon, San Rafael Valley, Arizona (Reed 1951). Based on color patterns of metamorphosed animals, Lowe (1954) described the Sonora tiger salamander from southern Santa Cruz County, Arizona, as the subspecies *stebbinsi* of the broad-ranging tiger salamander (*Ambystoma tigrinum*). However, again based on color patterns, Gehlbach (1965, 1967) synonymized *A. t. stebbinsi* and *A. t. utahense* (from the Rocky Mountains region) with *A. t. nebulosum* (from northern Arizona and New Mexico). Nevertheless, *A. t. stebbinsi* continued to be recognized in the scientific literature (Jones *et al.* 1988).

Jones *et al.* (1988) found Lowe's description of color patterns in *A. t. stebbinsi* was only accurate for recently metamorphosed individuals and that older metamorphosed adults exhibited either a distinctive reticulate pattern or large light-colored blotches on a dark background similar to *A. t. mavortium*, found in the central United States and adjacent portions of Mexico. Starch gel electrophoresis of 21 presumptive gene loci of *A. t. stebbinsi* were compared with gene loci of *A. rosaceum* (from Sonora), *A. t. mavortium*, and *A. t. nebulosum* (Jones *et al.* 1988). Based on this analysis, distinctive reticulate color patterns, low heterozygosity, and apparent geographic isolation, subspecific designation of *A. t. stebbinsi* was considered warranted by Collins and Jones (1987) and Jones *et al.* (1988). Further analysis of mitochondrial DNA reaffirmed subspecific designation and suggested that *A. t. stebbinsi* may have been derived from hybridization between *A. t. nebulosum* and *A. t. mavortium* (Collins *et al.* 1988).

The grassland community of the San Rafael Valley and surrounding hillsides, where all extant populations of *A. t.*

*stebbinsi* occur, may represent a relictual grassland and a refugium for tiger salamander populations that became isolated and, over time, genetically distinct.

Based on color patterns and electrophoretic analysis, *Ambystoma* collected in Mexico at one site in Sonora and 17 sites in Chihuahua were all *A. rosaceum*, not *A. t. stebbinsi* (Jones *et al.* 1988). Reanalysis of reported *A. t. stebbinsi* collected in Sonora (Hansen and Tremper 1979) and at Yepomera, Chihuahua (Van Devender 1973) revealed that these specimens were actually *A. rosaceum* (Jones *et al.* 1988).

Collins *et al.* (1988) list 18 recorded sites for the Sonora tiger salamander. All of these sites are in the headwaters of the Santa Cruz River, including sites in the San Rafael Valley and adjacent foothills of the Patagonia and Huachuca Mountains and the Canelo Hills, in Santa Cruz and Cochise Counties, Arizona. The taxon is currently extant at 15 of these sites, where populations of mature branchiataes range from approximately 50 to several hundred (Collins and Jones 1987). Populations of Sonora tiger salamanders also have been discovered recently in Scotia Canyon on the western slopes of the Huachuca Mountains (Jeff Howland, Arizona Game and Fish Department, pers. comm. 1993) and in Copper Canyon of the Huachuca Mountains (Russell Duncan, Southwestern Field Biologists, pers. comm. 1993). Salamanders tentatively identified as Sonora tiger salamander also have been found recently at Portrero del Alamo at the Los Fresnos cienega in the headwaters of the San Pedro River, San Rafael Valley, Sonora, Mexico (Sally Stefferud, U.S. Fish and Wildlife Service, pers. comm. 1993). In addition, a single terrestrial Sonora tiger salamander was found near Oak Spring in Copper Canyon of the Huachuca Mountains (J. Howland, pers. comm. 1993). This individual probably moved from the newly discovered aquatic population located approximately 1 km (0.6 mi) to the southwest. All historic and extant sites occur within 31 km (19 mi) of Lochiel, Arizona. The Los Fresnos and Oak Spring sites are springs or cienegas; all other sites are livestock tanks or impounded cienegas. Historically, the Sonora tiger salamander probably inhabited springs and cienegas where permanent or nearly permanent water allowed survival of mature branchiataes.

Other potential localities have been surveyed in or near the San Rafael Valley, but no other Sonora tiger salamander populations have been found. *A. rosaceum* and *A. t. velasci*

occur at localities in Sonora and Chihuahua to the south and east of the extant range of the Sonora tiger salamander (Collins 1979, Collins and Jones 1987, Van Devender and Lowe 1977). *A. t. mavortium* occurs at scattered localities to the east in the San Pedro, Sulphur Springs, and San Simon Valleys (Collins and Jones 1987), but at least some of these populations were introduced by anglers and bait collectors (Collins 1981, Lowe 1954, Nickerson and Mays 1969).

A variety of human activities threaten the Sonora tiger salamander. The species has been recently extirpated from at least three of the 18 localities described by Collins *et al.* (1988). Disease and predation by introduced nonnative fish and bullfrogs (*Rana catesbeiana*) have been implicated in the extirpation of these populations (Collins and Jones 1987). Tiger salamanders are also widely used as fishing bait in Arizona, and this use poses additional threats. Other subspecies of tiger salamander introduced into habitats of the Sonora tiger salamander for bait propagation could, through interbreeding, genetically swamp the distinct *A. t. stebbinsi* populations (Collins and Jones 1987). Collecting Sonora tiger salamanders for bait could also extirpate or greatly reduce populations. Additional threats include habitat destruction, reduced fitness resulting from low genetic heterozygosity, and the increased probability of stochastic extirpation characteristic of small populations.

#### Previous Federal Action

Federal government actions on *Spiranthes delitescens*, *Lilaeopsis schaffneriana* ssp. *recurva*, and Sonora tiger salamander began with their inclusion in various Service notices of taxa under review for listing as endangered or threatened species. Sonora tiger salamander was included as a category 2 candidate in the first notice of review of vertebrate wildlife (December 30, 1982; 47 FR 58454), and in subsequent notices published September 18, 1985 (50 FR 37958), and January 6, 1989 (54 FR 554). Category 2 candidates are those for which the Service has some evidence of vulnerability, but for which there is insufficient scientific and commercial information to support a proposed rule to list them as threatened or endangered. The most recent animal notice, published November 15, 1994 (59 FR 58982), included the Sonora tiger salamander in category 1. Category 1 includes those taxa for which the Service has sufficient information to

support proposed rules to list the species as threatened or endangered.

*Lilaeopsis schaffneriana* ssp. *recurva*, then under the name *L. recurva*, was included as a category 2 candidate in the November 28, 1983 (45 FR 82480) and September 27, 1985 (50 FR 39526) plant notices. It was included under its present name as a category 1 candidate in the February 21, 1990 (55 FR 6184), and September 30, 1993 (58 FR 51144), notices.

*Spiranthes delitescens* was included for the first time in the September 30, 1993, plant notice. It was included in that notice as a category 1 candidate.

On June 3, 1993, the Department of the Interior, Washington, DC, received three petitions, dated May 31, 1993, from a coalition of conservation organizations (Suckling *et al.* 1993). The petitioners requested the listing of *Spiranthes*, *Lilaeopsis*, and Sonora tiger salamander as endangered species pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). On December 14, 1993, the Service published a notice of three 90-day findings that the petitions presented substantial information indicating that listing these three species may be warranted, and requested public comments and biological data on the status of the species (58 FR 65325).

Section 4(b)(3)(B) of the Act requires the Secretary to reach a final decision on any petition accepted for review within 12 months of its receipt. Publication of this proposed rule constitutes the warranted findings for the petitioned actions.

#### Summary of Factors Affecting the Species

Section 4 of the Endangered Species Act and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the Federal lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to *Spiranthes delitescens* Sheviak (Canelo Hills ladies'-tresses), *Lilaeopsis schaffneriana* ssp. *recurva* (A.W. Hill) Affolter (Huachuca water umbel), and the Sonora tiger salamander (*Ambystoma tigrinum stebbinsi* Lowe) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* Humans have affected southwestern riparian systems over a period of several thousand years. From prehistoric or historic times, human settlement in southern Arizona has centered on oasis-

like cienegas, streams, and rivers. Before the early 1800s, indigenous peoples and missionaries used southern Arizona cienegas and riparian areas mostly for subsistence enterprises, including wood cutting, agriculture (including livestock grazing), and food and fiber harvesting. In the early 1800s, fur trappers nearly eliminated beaver from southern Arizona streams and rivers (Davis 1986) significantly changing stream morphology. In addition, human-caused fires and trails may have significantly altered riparian systems (Bahre 1991, Dobyns 1981).

There was a significant human population increase in southern Arizona and northern Sonora in the early to middle 1800s. New immigrants substantially increased subsistence and commercial livestock production and agriculture. By the late 1800s, many southern Arizona watersheds were in poor condition primarily due to uncontrolled livestock grazing, mining, hay harvesting, timber harvesting, and other management practices, such as fire suppression (Bahre 1991, Humphrey 1958, Martin 1975). The watershed degradation caused by these management practices led to widespread erosion and channel entrenchment when above average rainfall and flooding occurred in the late 1800s (Bahre 1991, Bryan 1925, Dobyns 1981, Hastings and Turner 1980, Hendrickson and Minckley 1984, Martin 1975, Sheridan 1986, Webb and Betancourt 1992). These events contributed to long-term cienega and riparian habitat degradation throughout southern Arizona and northern Mexico. Physical evidence of cienega and other riparian area changes can be found in the black organic soils of the drainage cut banks in the San Rafael Valley (Hendrickson and Minckley 1984), San Pedro River (Hereford 1992), Black Draw, and elsewhere. Although these changes took place nearly a century ago, the ecosystem has not fully recovered and, in some areas, may never recover.

Wetland habitat degradation and loss continues today. Human activities such as groundwater overdrafts, surface water diversions, impoundments, channelization, improper livestock grazing, chaining, agriculture, mining, road building, nonnative species introductions, urbanization, wood cutting, and recreation all contribute to riparian and cienega habitat loss and degradation in southern Arizona. The local and regional effects of these activities are expected to increase with increasing human population. Each threat is discussed in more detail below.

Growing water demand threatens the existence of southern Arizona perennial

surface water and the species that depend on it. The North American Free Trade Agreement (NAFTA) will likely stimulate borderland development, with a concurrent water demand increase that could accelerate riparian area destruction and modification and increase threats to plants and animals dependent on surface water, including the species in this proposal.

The largest area currently available for recovery of *Lilaeopsis* is the San Pedro River along the perennial reach between Hereford and Fairbank. Whether or not the species can be recovered there depends largely on the future presence of perennial surface flows in the river and a natural unregulated hydrograph. Perennial flow in the San Pedro River between Hereford and Fairbank comes from a deep regional aquifer and a shallower floodplain (alluvial) aquifer (Arizona Department of Water Resources 1991, Arizona Department of Water Resources 1994, Jackson *et al.* 1987, Vionnet and Maddock 1992). Groundwater pumping from both the regional and floodplain aquifers has occurred for some time and threatens the base flow in the river (Jackson *et al.* 1987, University of Arizona San Pedro Interdisciplinary Team 1991). Pumping from wells used primarily for agriculture, particularly in the Palominas and Hereford area, is having the largest current effect on the floodplain aquifer (Arizona Department of Water Resources 1994, Jackson *et al.* 1987). A significant effect to the regional aquifer results from groundwater pumping from deeper wells that are the main sources of municipal, military, and industrial water for Sierra Vista, Fort Huachuca Military Reservation, and Huachuca City (Jackson *et al.* 1987, Arizona Department of Water Resources 1991 and 1994, Vionnet and Maddock 1992). Groundwater pumping from this deep regional aquifer has formed a cone of depression in the Sierra Vista/Fort Huachuca area intercepting mountain front flows that would have contributed to aquifer recharge (Arizona Department of Water Resources 1994, Jackson *et al.* 1987).

Groundwater pumping is expected to increase with human population growth. In anticipation of population growth, Fort Huachuca Military Reservation has filed a claim for 10,087 acre-feet (A-F) per year of tributary groundwater, more than three times the estimated 3,000 A-F currently used (Arizona Department of Water Resources 1991). Even if water conservation measures are employed, groundwater drafts and the capture of mountain front recharge are likely to adversely affect flows in the San Pedro

River. If base flow in the river continues to decrease, the future existence of the riparian plant community is threatened (Arizona Department of Water Resources 1994, Jackson *et al.* 1987). If the groundwater drops below the elevation of the channel bed, the wetland plant (herb) association where *Lilaeopsis* is found will be the first plant association lost (Arizona Department of Water Resources 1994).

Fort Huachuca Military Reservation also relies on water from a well and springs in Garden Canyon (Arizona Department of Water Resources 1991). These diversions and pumping could dewater the stream and damage or destroy the *Lilaeopsis* population, particularly during below-average rainfall periods.

Flows in certain reaches of the Santa Cruz River remained perennial until groundwater pumping lowered the water table below the streambed. In 1908, the water table near Tucson was above the streambed, but from 1940–1969, the water table was 6.0–21.0 m (20–70 ft) below the streambed (De la Torre 1970). Recovery of perennial flow in the Santa Cruz River and of *Lilaeopsis* near Tucson is unlikely, given the importance of groundwater for the metropolitan area.

Groundwater pumping in Mexico threatens *Lilaeopsis* populations on both sides of the border. South of the San Bernardino National Wildlife Refuge, groundwater is being pumped to irrigate farmlands in Mexico, and this pumping threatens to dry up the springs and streams that support several listed endangered fish and a population of *Lilaeopsis*. The large copper mine at Cananea, Sonora, pumps groundwater for processing and support services. Although little is known about how groundwater pumping near Cananea may affect the spring at Ojo de Agua de Cananea, it is likely that overdrafts would decrease springflow or dewater the spring, extirpating the *Lilaeopsis* population. The spring at Ojo de Agua de Cananea is also the main municipal water source for the town of Cananea. This water diversion, particularly if increased, may adversely affect *Lilaeopsis*.

Sections of many southern Arizona rivers and streams have been channelized for flood control, which disrupts natural channel dynamics and promotes the loss of riparian plant communities. Channelization modifies the natural hydrograph above and below the channelized section, which may adversely affect *Lilaeopsis* and *Spiranthes*. Channelization will continue to contribute to riparian habitat decline. Additional

channelization will accelerate the loss any/or degradation of *Lilaeopsis* and *Spiranthes* habitat.

Dredging extirpated the *Lilaeopsis* population in House Pond, near the extant population in Black Draw (Warren *et al.* 1991). The *Lilaeopsis* population at Zinn Pond in St. David near the San Pedro River was probably lost when the pond was dredged and deepened. This population was last documented in 1953 (Warren *et al.* 1991).

Livestock grazing potentially affects *Lilaeopsis* at the ecosystem, community, population, and individual levels. Cattle generally do not eat *Lilaeopsis* because the leaves are too close to the ground, but they can trample plants. *Lilaeopsis* is capable of rapidly expanding in disturbed sites and could recover quickly from light trampling by extending undisturbed rhizomes (Warren *et al.* 1991). Light trampling may also keep plant density low providing favorable *Lilaeopsis* microsites.

Poor livestock grazing management can destabilize stream channels and disturb cienega soils creating conditions unfavorable for *Lilaeopsis*, which requires stable stream channels and cienegas. Such management can also change riparian community structure and diversity causing a decline in watershed conditions. Poor livestock grazing management is widely believed to be one of the most significant factors contributing to regional stream channel entrenchment in the late 1800s.

Poor livestock grazing management in Mexico has severely degraded the riparian area along Black Draw and its watershed. The degraded habitat most likely contributed to the severity of a destructive scouring flood on San Bernardino Creek in 1988, which extirpated two patches of *Lilaeopsis*. Overgrazing is occurring immediately adjacent to the San Bernardino National Wildlife Refuge and has destabilized the channel of Black Draw. A headcut moving upstream threatens to undermine the riparian area recovery that has occurred since the refuge was acquired. The refuge is implementing management to avoid the destructive downstream grazing effects.

Well managed livestock grazing and *Lilaeopsis* are compatible. The fact that *Lilaeopsis* and its habitat occur in the upper Santa Cruz River system in the San Rafael Valley attests to the good land stewardship of the private landowner and of prior generations of the family.

The effect of livestock grazing on *Spiranthes* is unclear. A *Spiranthes* population growing at a site grazed for

more than 100 years is larger and more vigorous than a population growing at a site ungrazed since 1969 (McClaran and Sundt 1992, Newman 1991). Sundt (pers. comm. in Newman 1991) has suggested differences in soil moisture and topography between the two sites could explain the differences in *Spiranthes* population size and vigor. Another explanation is that *S. delitescens*, like many species in the genus, shows an affinity for habitats with sparse herbaceous cover (McClaran and Sundt 1992). Further research is needed, but the Service's preliminary conclusion is that well managed livestock grazing does not harm *Spiranthes* populations.

Livestock often denude the vegetation around stock tanks. The impact of this effect on Sonora tiger salamander populations is unknown (Collins and Jones 1987), however, the Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*), a related endangered species from the central coast of California requires dense vegetation around breeding ponds and surrounding uplands used by mature metamorphs (U.S. Fish and Wildlife Service 1986). Aquatic, shoreline, and nearby terrestrial vegetation cover at Sonora tiger salamander breeding ponds likely conceals salamanders from predators and provides a forage base for invertebrates that make up a portion of the salamander's diet. In addition, livestock probably trample metamorphs, eggs, and possibly brachiote salamanders. Although Sonora tiger salamanders persist in stock tanks heavily used by cattle, the effects of grazing and trampling probably reduce the viability of these populations.

Sand and gravel mining along the San Pedro, Babocomari, and Santa Cruz Rivers in the United States has occurred, and probably will continue unless regulated, although no mining occurs within the San Pedro Riparian National Conservation Area. Sand and gravel mining removes riparian vegetation and destabilizes the ecosystem, which could cause *Spiranthes* or *Lilaeopsis* habitat or population losses upstream or downstream from the mining. These mines also pump groundwater for processing, and could locally affect groundwater reserves and perennial stream base flows. Since 1983, groundwater has been used to wash sand and gravel mined near the Babocomari River. 0.8 km (0.5 mi) west of highway 90 (Arizona Department of Water Resources 1991). This activity could affect at least one *Spiranthes* population.

Rural and urban development, road building, chaining, agriculture, mining, and other land disturbances can adversely affect *Lilaeopsis*. These activities are common in the middle Santa Cruz basin, but much less prevalent in the San Pedro basin. For these reasons, conservation and recovery of the middle Santa Cruz River is unlikely, but may still be possible for the upper San Pedro watershed, given region-wide planning decisions favorable to good watershed management. Increased development in the upper San Pedro Valley, including the expansion of existing cities and increased rural development, will likely increase erosion and have other detrimental hydrologic effects.

There are few watershed-level disturbances in the upper Santa Cruz and Black Draw drainages. There were irrigated fields in the Black Draw watershed, but these were abandoned when the Service acquired the area as a refuge. The fields are returning to natural vegetation. The San Rafael Valley, which contains the upper Santa Cruz River, is privately owned, well managed, and currently undeveloped, with few watershed disturbing activities. However, there is potential for commercial development in the upper Santa Cruz basin and resulting watershed effects.

Riparian areas and cienegas offer oasis-like living and recreational opportunities for residents of southern Arizona and northern Sonora. Riparian areas and cienegas such as Sonoita Creek, the San Pedro River, Canelo Hills cienega, and the perennial creeks of the Huachuca Mountains receive substantial recreational visitation, and this is expected to increase with the increasing southern Arizona population. While well-managed recreation is unlikely to extirpate *Spiranthes* or *Lilaeopsis* populations, severe impacts in unmanaged areas can compact soils, destabilize stream banks, and decrease riparian plant density.

Stream headcutting threatens the *Lilaeopsis* and presumed Sonora tiger salamander populations at Los Fresnos cienega in Sonora. Erosion is occurring in Arroyo Los Fresnos downstream from the cienega and the headcut is moving upstream. The causes of this erosion are uncertain, but are presumably from livestock overgrazing and roads in this sparsely populated region. If the causes of this erosion are left unchecked and headcutting continues, it is likely the cienega habitat will be lost within the foreseeable future. The loss of Los Fresnos cienega may extirpate the *Lilaeopsis* and Sonora tiger salamander populations. If the salamanders at the

Los Fresnos cienega are Sonora tiger salamanders, this would represent the only known natural cienega habitat occupied by an aquatic population of this species.

The 15 extant aquatic Sonora tiger salamander populations described by Collins *et al.* (1988) and the new localities in Scotia Canyon and Copper Canyon are all in stock tanks or impounded cienegas constructed to collect runoff for livestock. Most of these tanks likely date to the 1920s and 1930s when government subsidies were available to offset construction costs (Brown 1985). These stock tanks, to some degree, have created and replaced permanent or semi-permanent Sonora tiger salamander water sources.

Although the tanks provide relatively permanent aquatic habitats, current management and the dynamic nature of these artificial impoundments compromise their ability to support salamander populations in the long term. The tanks collect silt from upstream drainages and must be cleaned out periodically, typically with heavy earth moving equipment. This maintenance is done when stock tanks are dry or nearly dry at an average interval of about 15 years (L. Dupee. Coronado National Forest, Sierra Vista, Arizona, pers. comm. 1993). As the tanks dry out, aquatic salamanders typically metamorphose and migrate from the pond. However, if water is present during maintenance, some branchiate salamanders would likely be lost due to excavation of the remaining aquatic habitat. Any terrestrial metamorphs at the tank or in areas disturbed would also be lost during maintenance activities.

Flooding and drought pose additional threats to stock tank populations of Sonora tiger salamanders. The tanks are simple earthen impoundments without water control structures. Heavy flooding could erode and breach downstream berms resulting in aquatic habitat loss. Long-term drought could dry up the tanks.

Sonora tiger salamanders have persisted in stock tanks despite periodic maintenance, flooding, and drought. If the tanks refill soon after events that damage the aquatic habitat, they could presumably be recolonized through terrestrial metamorph reproduction. However, if a tank was dry for several years and isolated from other salamander populations, insufficient terrestrial salamanders may remain and immigration from other populations may be inadequate to recolonize the stock tank. Potential grazing practice changes also threaten aquatic Sonora tiger salamander populations. Stock

tanks could be abandoned or replaced by other watering facilities, such as windmills and troughs, which do not provide habitat for salamanders.

*B. Overutilization for commercial, recreational, scientific, or educational purposes.* No commercial, recreational, or educational uses for *Lilaeopsis* are known. A limited amount of scientific collecting is likely, but is expected to pose no threat to the species.

Although no specific cases of commercial *Spiranthes delitescens* collecting have been documented, commercial dealers, hobbyists, and other collectors are widely known to significantly threaten some natural orchid populations. The commercial value of an orchid may increase after it is listed as threatened or endangered. To limit the possible adverse effects of illegal collecting, no specific *Spiranthes* population locations are discussed in this proposed rule, nor will critical habitat be designated. No recreational or educational uses for *Spiranthes* are currently known. The small amount of scientific collecting that has occurred is regulated by the Arizona Native Plant Law (A.R.S. Chapter 7, Article 1).

Collecting *Ambystoma* in the San Rafael Valley of Arizona is currently prohibited by Arizona Game and Fish Commission Order 41. Collins and Jones (1987) reported an illegal *Ambystoma* collection from the San Rafael Valley and suspected that bait collectors and anglers often move salamanders among stock tanks. The extent of this activity and its threat to populations is unknown. However, all Sonora tiger salamander populations are relatively small (Collins and Jones 1987). Collecting may significantly reduce the size of branchiate populations and increase the chance of extirpations.

*C. Disease or predation.* Neither *Lilaeopsis* nor *Spiranthes* are known to be threatened by disease or predation.

Sonora tiger salamanders are invariably eliminated through nonnative fish predation, particularly by sunfish and catfish (Collins and Jones 1987). Nonnative fish introductions were implicated in three recent Sonora tiger salamander extirpations from stock tanks (Collins *et al.* 1988). The effect of native fishes on salamander populations is unknown, but some native species may also prey on Sonora tiger salamanders.

Bullfrogs occur at some Sonora tiger salamander localities. These introduced predators likely prey on salamander eggs, larvae, and adults (Collins *et al.* 1988). They may also be a vector for a disease with symptoms similar to *Aeromonas* infection ("red leg") (Marcus 1981) that killed all branchiate

salamanders at Huachuca Tank, Parker Canyon Tank #1, and Inez Tank in 1985 (Collins *et al.* 1988). The latter two tanks were recolonized within the next two years, presumably by reproducing terrestrial metamorphs that survived the disease. However, no recolonization of Huachuca Tank had occurred as of spring 1988 (Collins *et al.* 1988), and the species was not observed there during surveys in 1993 (J. Collins, pers. comm. 1993). Nonnative fish were also present at Huachuca Tank and likely contributed to this extirpation.

Surveys conducted in 1993 and 1994 revealed that nonnative fish and bullfrogs were recently introduced at several northern San Rafael Valley Sonora tiger salamander localities. Populations appear very low or are extirpated at several of these localities, particularly in the northwestern portion of the valley. Additional survey work in 1994 will clarify the status of these populations. In contrast, populations in the southeastern portion of the valley appear large and robust (J. Collins, pers. comm. 1994).

*D. The inadequacy of existing regulatory mechanisms.* Many Federal and State laws and regulations can protect these three species and their habitat. However, Federal and State agency discretion allowed under these laws still permits adverse effects on listed and rare species. Adding *Lilaeopsis*, *Spiranthes*, and the Sonora tiger salamander to the endangered species list will help reduce adverse effects to these species and will direct Federal agencies to work towards their recovery.

None of the taxa in this proposed rule are considered rare, threatened, or endangered by the Mexican government (Secretario de Desarrollo Urbano Y Ecologia 1991), nor do their habitats receive special protection in Mexico.

On July 1, 1975, all species in the Orchid family (including *Spiranthes delitescens*) were included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES is an international treaty established to prevent international trade that may be detrimental to the survival of plants and animals. A CITES export permit must be issued by the exporting county before an Appendix II species may be shipped. CITES permits may not be issued if the export will be detrimental to the survival of the species or if the specimens were not legally acquired. However, CITES does not itself regulate take or domestic trade. CITES provides no protection to *Lilaeopsis* or the Sonora tiger salamander.

The Lacey Act (16 U.S.C. 3371 *et seq.*), as amended in 1982, provides some protection for these three species. Under the Lacey Act it is prohibited to import, export, sell, receive, acquire, purchase, or engage in interstate or foreign commerce in any species taken, possessed, or sold in violation of any law, treaty, or regulation of the United States, any Tribal law, or any law or regulation of any State. Interstate transport of protected species occurs despite the Lacey Act because enforcement is difficult.

The Federal Land Policy and Management Act of 1976 (FLPMA) (43 U.S.C. 1701 *et seq.*) and National Forest Management Act of 1976 (NFMA) (16 U.S.C. 1600 *et seq.*) direct Federal agencies to prepare programmatic-level management plans to guide long-term resource management decisions. The goals of the Coronado National Forest Plan (Plan) include a commitment to maintain viable populations of all native wildlife, fish, and plant species within the Forest's jurisdiction through improved habitat management (Coronado National Forest 1986a). The Plan provides a list of rare plants and animals found on the Forest, but gives only a very general description of programmatic-level management guidelines and expected effort (Coronado National Forest 1986a). The Coronado National Forest is committed to multiple use, and where the demands of various interest groups conflict, the Forest must make decisions that represent compromises among these interests (Coronado National Forest 1986b). These types of compromises have sometimes resulted in adverse effects to listed endangered and threatened species.

The Plan's endangered species program includes participation in reaching recovery plan objectives for listed species, habitat coordination and surveys for listed species, and habitat improvement (Coronado National Forest 1986b). After acknowledging budget constraints, the Plan states that studies of endangered plants will occur at approximately the 1980 funding level. The Coronado National Forest, which manages habitat for 10 of the 18 extant aquatic Sonora tiger salamander populations, considers the Sonora tiger salamander a sensitive species and a management indicator species, which receives special consideration in land management decisions (Coronado National Forest 1986a). The ability of the Forest Service to manage the three species addressed here is limited because many of the populations occur off Forest Service lands and/or require

ecosystem-wide management largely beyond Forest Service control.

The National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. § 4321-4370a) requires Federal agencies to consider the environmental impacts of their actions. NEPA requires Federal agencies to describe a proposed action, consider alternatives, identify and disclose potential environmental impacts of each alternative, and involve the public in the decision-making process. It does not require Federal agencies to select the alternative having the least significant environmental impacts. A Federal action agency may choose an action that will adversely affect listed or candidate species provided these effects were known and identified in a NEPA document.

All three species in this proposed rule inhabit wetlands that have varying protection under section 404 of the Federal Water Pollution Control Act of 1948 (33 U.S.C. 1251-1376), as amended, and Federal Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands). Cumulatively, these Federal regulations have been inadequate to halt population extirpations and habitat losses for the three proposed species.

The Arizona Native Plant Law (A.R.S. Chapter 7, Article 1) protects *Spiranthes delitescens* and *Lilaeopsis schaffneriana* spp. *recurva* as "highly safeguarded" species. A permit from the Arizona Department of Agriculture (ADA) must be obtained to legally collect these species on public or private lands in Arizona. Permits may be issued for scientific and educational purposes only. It is unlawful to destroy, dig up, mutilate, collect, cut, harvest, or take any living "highly safeguarded" native plant from private, State, or Federal land without a permit. However, private landowners and Federal and State public agencies may clear land and destroy habitat after giving the ADA sufficient notice to allow plant salvage. Despite the protections of the Arizona Native Plant Law, legal and illegal damage and destruction of plants and habitat occur.

Collecting *Ambystoma* in the San Rafael Valley is prohibited under Arizona Game and Fish Commission Order 41, except under special permit. Nevertheless, illegal collecting occurs (Collins and Jones 1987). The species is listed by the State as endangered (Arizona Game and Fish Department 1988), however, this designation affords the species or its habitat no legal protection. Transport and stocking of live bullfrogs and fishing with live bait fish or *Ambystoma* within the range of this salamander in Arizona is prohibited

by Arizona Game and Fish Commission Orders 41 and R12-4-316, respectively. However, bullfrogs and nonnative fish are present at several extant and historic Sonora tiger salamander localities and introductions continue (Collins and Jones 1987; James Collins, pers. comm. 1994). Furthermore, abandonment, modification, or breaching of stock tanks is allowed on either private or public lands. Such actions could eliminate Sonora tiger salamander populations.

State of Arizona Executive Order Number 89-16 (Streams and Riparian Resources), signed June 10, 1989, directs State agencies to evaluate their actions and implement changes, as appropriate, to allow for riparian resources restoration. Implementation of this regulation may ameliorate adverse effects of some State actions on the species in this rule.

*E. Other natural or manmade factors affecting its continued existence.* Arizona anglers and commercial bait dealers often introduce larval tiger salamanders into ponds for future bait collecting (Lowe 1954, Collins *et al.* 1988). Collins and Jones (1987) reported that tiger salamanders were illegally collected from the San Rafael Valley and transported to at least two tanks in the northern Patagonia Mountains. Bait dealers or others moving Sonora tiger salamanders to new locations could establish new populations. Collins and Jones (1987) suggest that moving of salamanders has greatly influenced their present distribution in the San Rafael Valley. Moving could also transmit disease and cause unintentional fish or bullfrog introductions, which would extirpate extant populations.

Moving poses an additional threat. *A. t. mavortium* is common in Arizona stock tanks and ponds to the east of the San Rafael Valley. Bait dealers and anglers introduced many of these populations (Collins 1981, Collins and Jones 1987). If *A. t. mavortium* is introduced into Sonora tiger salamander localities, populations could be lost due to genetic swamping by interbreeding of the two subspecies.

Two populations of *Lilaeopsis* have been lost due to unknown causes. Despite the presence of suitable habitat, no plans have been observed at Monkey Spring near Sonita Creek since 1965. *Lilaeopsis* collected in 1958 along the San Pedro River near St. David, but no longer exists there, nor is their suitable habitat.

Aggressive nonnative plants disrupt the native riparian plant community. The nonnative *Sorghum halepense* (Johnson grass) is invading one *Spiranthes* site (Gori *in litt.* 1993). This

tall grass forms a dense monoculture, displacing less competitive native plants. If Johnson grass continues to spread, the *Spiranthes* population may be lost (Gori *in litt.* 1993). *Cynodon dactylon* (Bermuda grass) also displaces native riparian plants, including cottonwoods and willows that stabilize stream channels. Bermuda grass forms a thick sod in which many native plants are unable to establish. In certain microsites, Bermuda grass may directly compete with *Lilaeopsis* or *Spiranthes*. There are no known effective methods for eliminating Bermuda grass or Johnson grass from natural plant communities.

*Rorippa nasturtium-aquaticum* (watercress) is another nonnative plant now abundant along perennial streams in Arizona. It is successful in disturbed areas and can form dense monocultures that can outcompete *Lilaeopsis* populations.

The limited number of populations and individuals threatens all three taxa in this proposed rule with demographic and environmental stochastic extinction. The restriction of these three species to a relatively small area in southeastern Arizona and adjacent Sonora also increases the chance that a single environmental catastrophe, such as a severe tropical storm, could eliminate populations or cause extinction. This is of particular concern for Sonora tiger salamanders inhabiting stock tanks that could wash out during a storm. Furthermore, Sonora tiger salamander genetic heterozygosity is the lowest reported for any salamander (Jones *et al.* 1988). Low heterozygosity indicates low genetic variation, which increases demographic stochasticity and the chance of local extirpations (Shafer 1990).

Finding of a Sonora tiger salamander recently at Oak Spring, approximately 1.0 km (0.6 mi) from the nearest known aquatic population, provides evidence these animals are capable of at least that distance of overland dispersal. Seasonal movement to and from breeding ponds is a common phenomenon in amphibians. Distances of these seasonal movements are generally less than 0.5 km (0.3 mi), although movements of more than 11 km (7 mi) have been documented for the red-bellied newt (*Taricha rivularis*) (Zug 1993). The ability of Sonora tiger salamanders to move between populations is unknown, but arid grassland, savanna, or pine-oak woodland separates all populations and movement through these relatively dry landscapes is probably limited. Movement would be most likely during storms or where wet drainages are available as movement corridors. The

distance between aquatic populations of Sonora tiger salamander is more than 2 km (1.2 mi) in most cases, and much greater distances separate many of the sites. Thus, even if these salamanders are capable of moving relatively long distances, some populations are probably effectively geographically isolated. Small isolated populations have an increased probability of extirpation (Wilcox and Murphy 1985). Once populations are extirpated, natural recolonization of these isolated habitats may not occur (Frankel and Soule 1981).

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these taxa in determining to propose this rule. These three taxa are vulnerable to one or more of the following threats—habitat degradation and loss through groundwater pumping, livestock grazing, watershed degradation, flooding, drought, urbanization, and recreation; nonnative plant and vertebrate competition or predation; disease; and increased extirpation chance due to low genetic variation in the Sonora tiger salamander. The limited distributions of these taxa and the small size of most extant populations makes them particularly vulnerable to extinction from stochastic events.

Because *Spiranthes*, *Lilaeopsis*, and the Sonora tiger salamander are in danger of extinction throughout all or significant portions of their ranges, they fit the Act's definition of endangered. Based on the Service's evaluation of the status and threats facing these species, the preferred action is to propose *Spiranthes*, *Lilaeopsis*, and the Sonora tiger salamander as endangered. The Service believes that designation of critical habitat is prudent for the *Lilaeopsis* and the Sonora tiger salamander, but finds that critical habitat is not now determinable for these two species. Critical habitat designation would not be prudent for the *Spiranthes*. The rationales for these decisions are discussed in the following section of this proposal.

#### Critical Habitat

Critical habitat is defined in Section 3 of the Act as—(i) The specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection and; (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon

a determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures needed to bring the species to the point at which listing under the Act is no longer necessary.

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 242.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time a species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not prudent for *Spiranthes delitescens* at this time. Service regulations (50 CFR 424.12(a)(1)) state that designation of critical habitat is not prudent when one or both of the following situations exist—(1) the species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species.

As discussed under Factor B in the "Summary of Factors Affecting the Species," *Spiranthes* is threatened by collecting. If it is listed, collecting of *Spiranthes* would be prohibited under the Act in cases of (1) removal and reduction to possession from lands under Federal jurisdiction, or malicious damage or destruction on such lands; and (2) removal, cutting, digging up, or damaging or destroying *Spiranthes* in knowing violation of any State law or regulation, including State criminal trespass law. Such provisions are difficult to enforce, and publication of critical habitat descriptions and maps would make *Spiranthes* more vulnerable and increase enforcement problems. All involved parties and principal landowners are aware of the location and importance of protecting this species' habitat. Habitat protection will be addressed through the recovery process and through the Section 7 provisions of the Act. Therefore it would not now be prudent to determine critical habitat for *Spiranthes delitescens*.

*Lilaeopsis* is not threatened by collecting and the Service knows of no circumstance where the species is threatened by vandalism. Therefore, critical habitat designation is prudent for this species.

Salamander collecting by bait dealers and anglers has been identified as a Sonora tiger salamander threat and publication of salamander localities rule could facilitate collecting. However, other subspecies of *A. tigrinum* are readily available from numerous less

remote Arizona localities, collecting these other subspecies is legal, and State law prohibits collecting and stocking salamanders in the range of the Sonora tiger salamander. Thus, publication of critical habitat localities is unlikely to substantially increase threats to the Sonora tiger salamander. The Service finds the benefits of designating critical habitat outweigh any risk of increased collecting and determines that designation of critical habitat is prudent for the Sonora tiger salamander.

Section 4(b)(2) of the Act requires the Service to consider economic and other impacts of designating a particular area as critical habitat. Information concerning probable impacts that would be associated with designation of critical habitat for these two species has not yet been fully assessed or analyzed. Efforts aimed at gathering and analyzing such information are currently underway, but have not been completed. Regulations at 50 CFR 424.12(a)(2)(i) specify that critical habitat is not determinable when "Information sufficient to perform required analyses of the impacts of the designation is lacking \* \* \*" The Service therefore finds that critical habitat for the Huachuca water umbel and the Sonora tiger salamander is not now determinable. When information becomes available and the review has been completed, the Service intends to propose designation of critical habitat for both species to the maximum extent prudent.

#### Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against certain activities involving listed species are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) requires Federal

agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. Two of the taxa in this proposal, the Sonora tiger salamander and *Lilaeopsis*, occur on the Coronado National Forest. The latter species also occurs on the Fort Huachuca Military Reservation managed by the Department of Defense.

Examples of Federal actions that may affect the three species in this proposal include—issuing mining permits, managing recreation, road construction, livestock grazing, granting right-of-ways, stock tank development and maintenance, and military activities. These and other Federal actions would require formal section 7 consultation if the action agency determines that the proposed action may affect listed species. Development on private or State lands requiring permits from Federal agencies, such as 404 permits from the U.S. Army Corps of Engineers, would also be subject to the section 7 consultation process. Private actions that are not Federally funded or permitted would require a section 10(a)(1)(B) permit if implementation would result in incidental take of Sonora tiger salamander.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered plants. All trade prohibitions of section 9(a)(2) of the Act, implemented by 50 CFR 17.61, apply. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to import or export, transport in interstate or foreign commerce in the course of a commercial activity, sell or offer for sale listed species in interstate or foreign commerce, or to remove and reduce the species to possession from areas under Federal jurisdiction. In addition, for plants listed as endangered, the Act prohibits the malicious damage or destruction on areas under Federal jurisdiction and the removal, cutting, digging up, or damaging or destroying of such plants in knowing violation of any State law or regulation, including State criminal trespass law. Certain

exceptions apply to agents of the Service and State conservation agencies.

The Act and 50 CFR 17.62 and 17.63 also provide for the issuance of permits to carry out otherwise prohibited activities involving endangered plants under certain circumstances. Such permits are available for scientific purposes and to enhance the propagation or survival of the species. It is anticipated that few trade permits would ever be sought or issued for *Lilaeopsis* or *Spiranthes* because these species are not common in cultivation or in the wild.

The Act and implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. The prohibitions codified at 50 CFR 17.21, in part, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect; or to attempt any of these), import or export, ship in interstate commerce in the course of a commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in the course of otherwise lawful activities.

Requests for copies of the regulations on listed plants and wildlife and inquiries about prohibitions and permits may be addressed to U.S. Fish and Wildlife Service, Branch of Endangered Species/Permits, P.O. Box 1306, Albuquerque, New Mexico 87103

(telephone 505/766-3972; facsimile 505/766-8063).

**Public Comments Solicited**

The Service intends that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule are hereby solicited. Comments particularly are sought concerning.

(1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to these species;

(2) The location of any additional populations of these species and the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;

(3) Additional information concerning the range, distribution, and population size of these species;

(4) Current or planned activities in the subject areas and their possible impacts on these species; and

Final promulgation of regulations on these species will take into consideration the comments and any additional information received by the Service, and such communications may lead to a final regulation that differs from this proposal.

The Endangered Species Act provides for one or more public hearings on this proposal, if requested. Request must be received within 45 days of the date of publication of the proposal in the **Federal Register**. Such requests must be made in writing and addressed to the State Supervisor (see **ADDRESSES** section).

**National Environmental Policy Act**

The Fish and Wildlife Service has determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the National Environmental

Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

**References Cited**

A complete list of all references cited herein, as well as others, is available upon request from the Arizona Ecological Services State Office (see **ADDRESSES** section).

**Authors**

The primary authors of this proposed rule are Susan Rutman, formerly of the Service's Arizona Ecological Services State Office, and Jim Rorabaugh (see **ADDRESSES** section).

**List of Subjects in 50 CFR Part 17**

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

**Proposed Regulation Promulgation**

Accordingly, the Service hereby proposes to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

**PART 17—[AMENDED]**

1. The authority citation for part 17 continues to read as follows:

**Authority:** 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500, unless otherwise noted.

2. Section 17.11(h) is amended by adding the following in alphabetical order, under "Amphibians," to the List of Endangered and Threatened Wildlife to read as follows:

**§ 17.11 Endangered and threatened wildlife.**

\* \* \* \* \*

(h) \* \* \*

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*		*	*
AMPHIBIANS							
*	*	*	*	*		*	*
Salamander, Sonora tiger.	<i>Ambystoma tigrinum stebbinsi</i> .	U.S.A. (AZ), Mexico	Entire .....	E		NA	NA
*	*	*	*	*		*	*

3. Section 17.12(h) is amended by adding the following two species in alphabetical order to the List of

Endangered and Threatened Plants to read as follows:

**§ 17.12 Endangered and threatened plants.**  
 \* \* \* \* \*  
 (h) \* \* \*

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
FLOWERING PLANTS							
* <i>Lilaeopsis schaffneriana</i> ssp. <i>recurva</i> .	* Huachuca water umbel.	* U.S.A. (AZ), Mexico	* Apiaceae .....	* E		* NA	* NA
* <i>Spiranthes delitescens</i> .	* Canelo Hills ladies'-tresses.	* U.S.A. (AZ) .....	* Orchidaceae .....	* E		* NA	* NA
*	*	*	*	*		*	*

Dated: March 29, 1995.

**Mollie H. Beattie,**

Director, U.S. Fish and Wildlife Service.

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