



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
ARIZONA ECOLOGICAL SERVICES FIELD OFFICE  
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2-21-93-I-237

April 2, 1993

Ms. Patricia Lindquist  
Housing Programs Branch  
U.S. Department of Housing and  
Urban Development  
Two Arizona Center, Suite 1600  
400 North Fifth Street  
Phoenix, Arizona 85004-2361

Dear Ms. Lindquist:

This letter responds to your March 30, 1993, request for formal section 7 consultation with the Fish and Wildlife Service (Service) pursuant to the Endangered Species Act (Act) of 1973, as amended, on the Le Mirage Apartments (project number 123-35220). The project proponent is planning to build a 168 unit apartment complex on the southwest corner of Palo Seco Road and Thornydale Road, Tucson, Arizona. The species potentially affected by this project is the endangered Tumamoc globeberry (*Tumamoca macdougallii*). There is no proposed or designated critical habitat that would be affected by the proposed action.

This biological opinion was prepared using information contained in the biological evaluation, telephone conversations, and other records furnished by the Department of Housing and Urban Development (HUD). Additional information was obtained from the Service's files and published literature, and through discussions with species experts and other knowledgeable individuals.

The 90-day formal consultation period began on March 31, 1993, the date your request was received by the Arizona Ecological Services Office.

Biological Opinion

It is the Service's biological opinion that this project is not likely to jeopardize the continued existence of the endangered Tumamoc globeberry.

## Background Information

### Consultation History

Sue Rutman, Service Botanist, discussed the proposed project with Mr. Emory Chuckley, the project proponent, on March 16, 1993. Ms. Rutman determined that HUD is considering insuring the loan. Ms. Rutman then spoke with Pat Lindquist, HUD Director of Housing Programs Branch, on March 22, 1993. Ms. Rutman recommended that formal consultation be initiated between HUD and the Service. The formal consultation will bring HUD into compliance with the Act. HUD initiated formal consultation with the Service on March 31, 1993.

### Description of Proposed Action

The project proponent proposes to build a 168 unit apartment complex on 8.3 acres. The property is bounded on the west by Thornydale Road and on the north by Palo Seco Road, northwest Tucson. HUD's proposed action is to ensure the loan that would support the construction of the apartment complex.

The proposed plan is to build the apartment complex on 8.3 acres that is currently covered with native Sonoran desertscrub vegetation, including palo verde (*Cercidium microphyllum*), velvet mesquite (*Prosopis velutina*), ironwood (*Olneya tesota*), triangle-leaf bursage (*Ambrosia deltoides*), saguaro (*Carnegiea gigantea*), and other woody perennial and cactus species. The property is between 2400-2500 feet elevation, has silty and clay-sandy soils, and drains south to southwest. The proposed action will result in the removal of native vegetation from the site and complete loss of potential *Tumamoca* habitat.

### Species Description and Environmental Baseline

Tumamoc globeberry (*Tumamoca macdougallii*) is a delicate perennial vine in the gourd family (Cucurbitaceae). The plants are found under trees or shrubs, which act as nurse plants and provide physical support for the vines. The stems arise from a large underground tuber, begin annual growth during the late summer in response to summer rains, and continue growing until the onset of cool weather and short days in November. The thin leaves have three main lobes, each divided into narrow segments. The flowers are small and pale greenish-yellow, with both male and female flowers occurring on a plant. The majority of flowers are produced in August. Mature fruits are spherical to ovoid, succulent, and bright red (Reichenbacher 1985a, Reichenbacher and Associates 1990).

When the species was listed as endangered in 1986, 30 isolated populations of Tumamoc globeberry had been located in Pima County, Arizona and 5 were known from Sonora, Mexico. The total number of known individuals was 2,300 in the United States and 60 in Mexico (April 29, 1986; 51 FR 15906). All populations were found in the Arizona Upland Subdivision of Sonoran Desertscrub Biotic Community. The eastern and western limits of the United States range of the species were known to include the Tucson area and

extend west about 120 miles [193 kilometers (km)] to the vicinity of Organ Pipe Cactus National Monument. The exact northern and southern range boundaries were unknown but extended about 400 km (250 miles) south of the U.S./Mexico border to the vicinity of Guaymas, Sonora.

Surveys and studies completed after the May 1985 publication of the proposed rule to list *Tumamoca macdougallii* have improved our understanding of the range and ecology of this species (Reichenbacher 1985a, Reichenbacher 1985b, Tierra Madre Consultants and Cornett & Associates 1985, Reichenbacher 1987, Biosystems Analysis 1988). Numerous surveys have been conducted on smaller tracts of land. The locations of most populations are contained in the Non-Game Data Management System of the Arizona Game and Fish Department.

Our understanding of *Tumamoca macdougallii* was greatly increased by a survey and study in the U.S. and Mexico contracted by the Bureau of Reclamation (Reichenbacher and Associates 1990). The study was required by a June 30, 1986, jeopardy biological opinion under Section 7 of the Act on the Central Arizona Project (pipeline and canal) and was conducted during the summers of 1988 and 1989. The report summarized the current range, distribution, and ecological information on *Tumamoca*.

The U.S./Mexico survey extended the northern and southern boundaries of the known range of *Tumamoca* (Reichenbacher and Associates 1990), although the eastern and western boundaries were essentially unchanged. The southern boundary, while not yet fully defined, was extended south to within 80 km (50 miles) of the northern border of Sinaloa, Mexico. The northern boundary was extended north to include southern Pinal and Maricopa Counties, Arizona. The distance between the northern and southern boundaries is more than 643 km (400 miles). Reichenbacher and Associates (1990) estimated the potential habitat of *Tumamoca* in the U.S. and Mexico to be 72,862 km<sup>2</sup> (27,959 square miles).

*Tumamoca* is less habitat specific than was believed at the time it was listed. The species occurs below 914 meters (3,000 feet) elevation in a variety of desert habitats and vegetation types, including the Arizona Upland, Lower Colorado Valley, Plains of Sonora, and Central Gulf Coast Subdivisions of the Sonoran Desertscrub Biotic Community and the Sinaloan Thornscrub Biotic Community (Reichenbacher and Associates 1990) (biotic communities defined by Turner and Brown 1982). It is found associated with a variety of nurse plants and in soils type ranging from sandy soils of valley bottoms to rocky soils of upper bajada slopes (Reichenbacher and Associates 1990). In the United States, *Tumamoca* occurs in isolated, discrete populations separated by large areas of apparently suitable but unoccupied habitat (Reichenbacher 1985a, Reichenbacher and Associates 1990). In Mexico, the species is widely scattered at a relatively low frequency throughout suitable habitat, with some areas of higher densities (Reichenbacher and Associates 1990). Depending on the site, habitat condition ranges from excellent or good to severely degraded or modified.

Surveys of potential habitat in the U.S. and Mexico showed the species to be more common than known at the time it was listed. Less than one percent (%) of the potential habitat in the U.S. and Mexico was searched in 1988 and 1,242 plants were located (Reichenbacher and Associates 1990). This search involved 444 quadrats in Sonora and 261 in Arizona. All quadrats were approximately 8 hectare (20 acre) rectangles. *Tumamoca* was found in 6 Arizona quadrats (2%) and 89 Sonora quadrats (20%). The new *Tumamoca* localities in Mexico were scattered fairly evenly throughout a 52,600 square kilometer (20,300 square mile) region. A statistically reliable extrapolation of the U.S./Mexico survey data can not be made due to sampling constraints; however, many more plants and populations almost certainly exist.

Most of the habitat of Tumamoc globeberry is remote desert, where few threats exist or are expected to occur. In more densely human populated areas of *Tumamoca*'s range, habitat is being lost to urban and agricultural development, habitat conversion to livestock pasture, and off-road vehicle traffic. Reichenbacher and Associates (1990) estimates that only 2-3% of *Tumamoca* habitat has been lost to agriculture and urban expansion. This estimate does not include desertscrub in Mexico converted to livestock pasture. A substantial number of quadrats in Mexico had to be relocated from their originally intended sites because of unmapped, presumably recently developed, livestock pasture. Habitat degradation is occurring due to erosion from a variety of sources, including historic and present livestock overgrazing, cross-desert dikes, and roads. Nevertheless, the large range of Tumamoc globeberry and the extreme remoteness of much of the habitat in both the U.S. and Mexico strongly suggest that significant portions of the range are secure for the foreseeable future.

Tumamoc globeberry populations are scattered throughout an estimated 72,862 km<sup>2</sup> (27,959 square miles) of habitat in five different vegetation types. As might be expected, some habitat loss and degradation is occurring within this area. However, Reichenbacher and Associates (1990) estimated less than 3% of *Tumamoca* habitat has been lost to agriculture and urban expansion. These losses tend to be concentrated along major watercourses or drainages, and urban centers such as Hermosillo, Sonora, and Tucson, Arizona.

Habitat loss from the Central Arizona Project was mitigated by the purchase of preserves, their fencing, and the transplanting and monitoring of plants that would have been lost to canal construction. The transplanting effort and subsequent monitoring have yielded valuable information on *Tumamoca* biology.

The Service has no information to indicate Tumamoc globeberry is negatively affected when habitat is destabilized and erosion is accelerated. In fact, Tumamoc globeberry populations exist and are apparently stable (C. Button, Bureau of Land Management, pers. comm., 1991) in the Avra and Vekol Valleys, where habitat conditions are poor and erosion is a serious problem.

Some areas in southern Arizona and Sonora are being converted from desertscrub to monotypic stands of buffelgrass (*Cenchrus ciliaris*) to provide livestock forage. Buffelgrass outcompetes native plant species, including Tumamoc globeberry. Conversely, natural grassy areas, especially savanna grasslands in central Sonora, have been denuded and replaced by desertscrub that may actually provide better habitat for Tumamoc globeberry than do grasslands (Reichenbacher and Associates 1990). This pattern of shrub encroachment due to overgrazing and conversion of desertscrub to pasture is expected to continue. Despite this habitat alteration, the future of Tumamoca should be secure in the large areas of undisturbed habitat that remain.

Recreation, which occurs mostly near large urban areas, has probably caused a small amount of habitat loss or degradation, most of this in the form of off-road vehicle use. A popular picnic area on the Coronado National Forest contains a population of Tumamoc globeberry. Despite the heavy recreational use of this area, the population appears to be stable (Reichenbacher 1989), although January 1993 flooding may have adversely affected the population.

The final rule to list this species identified scientific collection as a potentially significant threat due to the rarity of the species and the small size of many populations. Tumamoca is now more common than previously believed, and the amount of damage that could be caused to the species from possible scientific collecting is, therefore, proportionally less. No commercial, recreational, scientific or educational overuse of this species is known to have occurred.

Javelina uproot the *Tumamoca* tubers to eat the succulent tissues, which sometimes kills the plant or reduces its vigor or reproductive output. Significant damage is also done by lagomorphs and/or rodents. Many plants are found with their stems clipped at or above ground level. This is likely seldom fatal but undoubtedly affects the ability of the plant to store photosynthate and moisture for the next growing season (Reichenbacher 1985a). These predators are all native species and Tumamoc globeberry has undoubtedly evolved to cope with the level of damage inflicted. Perhaps the scattered populations and absence of plants in apparently suitable habitat is, in part, a response to pressure from predators.

Tumamoc globeberry currently receives the protection of the Arizona Native Plant Law and the Act. It is considered a Sensitive Species by the Forest Service and the Bureau of Land Management (BLM), a provision which offers some management protection. If Tumamoc globeberry is removed from the Endangered Species List, the Forest Service and BLM have indicated the species will remain on their Sensitive Species lists.

Based on the new information about the species' range, abundance, and threats, the Service proposed to remove Tumamoc globeberry from the endangered species list. The proposed rule to delist Tumamoc globeberry was published in the Federal Register on August 21, 1992. On or before August 21, 1993, the Service must determine if the

proposed rule should be finalized or withdrawn, or if the decision should be postponed. In the interim, the Tumamoc globeberry is considered fully protected under the Act.

### Effects of the Proposed Action

#### Direct and Indirect Effects

No surveys for Tumamoc globeberry on the proposed project area have been conducted, but the habitat is suitable. Surveys for this species can only be conducted between August 15 through November 1. Before and after this period, the plants are dormant and aboveground parts can not be seen, or are difficult to see. The project proponent wishes to proceed with this project before the survey period commences. Therefore, in the analysis of effects, we shall address the loss of habitat and an unknown number of plants.

The Service estimates that between 0 and 100 Tumamoc globeberry plants may occur within the proposed project area. Habitat loss amounts to 8.3 acres. Loss of this habitat will cause habitat fragmentation and contribute to degradation of nearby habitat. The general area is already considerably fragmented by urban development and other disturbances, and the development of this parcel will not contribute a significant amount of fragmentation.

#### Effects to Survival and Recovery

The loss of 8.3 acres of potential Tumamoc globeberry habitat will not affect the survival and recovery of the species. The extensive range of the species and abundance of plants in the United States and Mexico means that this proposed project, while contributing to habitat loss and potentially contributing to loss of plants, will not affect the survival and recovery status of the species.

#### Cumulative Effects

The effects of small projects on Tumamoc globeberry in the Tucson metropolitan area have been significant. Before European settlement, the Tucson Basin and Avra Valley were probably occupied by Tumamoc globeberry. Almost all habitat in the Tucson basin for Tumamoc globeberry is now completely lost or fragmented, and large portions of former habitat in the Avra Valley have been lost, degraded, or fragmented. These areas, however, constitute a relatively small part of the species' range. In general, vast areas of Tumamoc globeberry habitat remain unaltered. We conclude that this project, while contributing to cumulative effects to the species, will not change the status of the species.

### Conservation Recommendations

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" has

been defined as Service suggestions regarding discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for the species.

The Service recommends that ground disturbing activities and damage or destruction of native vegetation be limited to the extent possible.

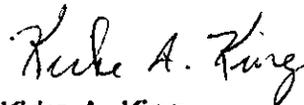
In order for the Service to be kept informed of actions that either minimize or avoid adverse effects or benefit listed species or their habitats, the Service is requesting notification of the implementation of any conservation recommendations.

### Conclusion

This concludes formal consultation on the Le Mirage apartment complex. As required by 50 CFR §402.16, reinitiation of formal consultation is required if: 1) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion, 2) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this opinion, or 3) a new species is listed or critical habitat designated that may be affected by the action.

The Service would appreciate notification of your final decision on this action. In future communications on this project, please refer to consultation number 2-21-93-I-237. If we may be of further assistance, please contact Sue Rutman or Sam F. Spiller, Field Supervisor.

Sincerely,



Kirke A. King  
Acting Field Supervisor

cc: Chief, Fish and Wildlife Service, Arlington, Virginia (DES)  
Regional Director, Fish and Wildlife Service, Albuquerque, New Mexico (AES)  
Robert Dummer, Regulatory Branch, Army Corps of Engineers, Phoenix,  
Arizona

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