the relict leopard frog, which may indicate a history of bottlenecking or small effective population size.

Summary of Status Review

Conservation Actions Implemented

The Conservation Team was established in March 2001, and has since met at least twice each year for the past 15 years to establish and carry forward the conservation and monitoring program for the relict leopard frog. The Conservation Team has included Federal, State, and local representatives from the Service, NPS, BLM, BR, the Environmental Protection Agency, the Nevada Department of Wildlife, the Arizona Game and Fish Department, the Utah Division of Wildlife Resources, Clark County (Nevada), the Southern Nevada Water District (including the Las Vegas Springs Preserve), the University of Nevada-Las Vegas, and the University of Nevada-Reno. The primary objective of the Conservation Team was to develop and implement the 2005 Conservation Agreement. Much conservation occurred prior to finalization of the Conservation Agreement, and the Conservation Team developed the first annual work plan in 2003. Conservation actions continue to be implemented by partners through annual work plans. Revision of the Conservation Agreement is in development with an anticipated completion date of late 2016. Part of the management effort the Conservation Team undertakes to increase population sizes and expand the distribution of the species is to collect portions of relict leopard frog egg masses from natural sites, and then captive-rear and translocate them to appropriate sites as late-stage tadpoles and juvenile frogs. The Conservation Team may augment any population, natural or introduction, as determined necessary to conserve the species.

The main relict leopard frog conservation actions, both those completed and ongoing into the foreseeable future, are:

- Remove or substantially minimize threats to extant populations and occupied habitats.
- Enhance existing habitat and/or create new habitats where feasible.
- Establish additional populations of relict leopard frogs in existing or created habitats.
- Manage relict leopard frogs and their habitats to ensure persistence in diverse aquatic ecosystems, and facilitate processes that promote selfsustaining populations.
- Monitor relict leopard frog populations.

• Investigate the conservation biology of the relict leopard frog, and use the results of such investigations to better meet the overall conservation goal and objectives.

Current Analysis of Stressors Impacting the Relict Leopard Frog

In completing our status review for the relict leopard frog, we reviewed the best available scientific and commercial information, and compiled this information in the SSA Report for the relict leopard frog. We evaluated the potential threats (identified in the SSA Report as "stressors" or "potential stressors," and consistent with the Act's five threat factors identified in the SSA Report) that may be operative upon the relict leopard frog currently or in the future.

As required by the Act, we considered the five threat factors in assessing whether the relict leopard frog is endangered or threatened throughout all or a significant portion of its range. We examined the best scientific and commercial information available regarding the past, present, and future stressors faced by the relict leopard frog. We reviewed the information available in our files and other available published and unpublished information, and we consulted with recognized relict leopard frog species and habitat experts and other Federal, State, and tribal agencies. Listing under the Act is warranted if, based on our review of the best available scientific and commercial information, we find that the stressors to the relict leopard frog are so severe or broad in scope as to indicate that the species is in danger of extinction (endangered), or likely to become endangered within the foreseeable future (threatened), throughout all or a significant portion of its range.

In the SSA Report we evaluated each of the potential stressors for the relict leopard frog, and we determined that the following factors have impacted, or may impact individuals, specific sites, or portions of suitable habitat in the future: (1) Alteration of natural spring and groundwater systems and reduced habitat connectivity; (2) overgrowth of emergent vegetation and nonnative or invasive plants; (3) excessive disturbance due to feral horses, burro, and livestock use; (4) disease; (5) nonnative fish predation; (6) small population size; and (7) climate change, flash flood events, and wildfire. Although these stressors may continue to affect the relict leopard frog, they are not causing a population-level risk to the species now nor are they expected to do so into the foreseeable future.

Overutilization and crayfish and bullfrog predation were evaluated in the SSA Report for the relict leopard frog but were found to result in no or low impacts, respectively, across the species' range. Thus, we do not discuss overutilization or predation further in this document. We have summarized the threats analysis from the SSA Report below. A complete description of those stressors and threats, and how they affect the viability of the species, is included in the SSA Report.

The effects of historical alteration of natural riverine and groundwater systems and reduced habitat connectivity to the relict leopard frog at the individual or site-specific level are ongoing and may continue into the future. However, there have not been any recent alterations of natural riverine and groundwater systems and reduced habitat connectivity on relict leopard frog populations and their habitat. Historical modification to the Colorado and Virgin rivers effectively isolated the two metapopulations of relict leopard frog, and they will most likely never be reconnected. Although the two relict leopard frog metapopulations and most relict leopard frog introduction sites are not connected, ongoing management actions by the Conservation Team minimizes population isolation through captive rearing and translocation of frogs to targeted sites. We conclude that there are effects to relict leopard frog populations and perhaps the species from historical alteration of natural riverine and ground water systems and reduced habitat connectivity, but these the effects are low in severity and do not threaten the persistence of the species.

Some sites can have overgrowth of vegetation that can have adverse effects on relict leopard frogs that reduce the extent of surface water and habitat for breeding and feeding. These effects from overgrowth of vegetation are low in severity because they are reduced by storms that remove vegetation through scouring, by manual removal, and by grazing.

Burro and cattle grazing have both degraded and improved aquatic habitat at some sites. Controlled, low-level grazing typically provides disturbance that benefits frog habitat by removing excess vegetation. If grazing increases to heavy use, habitat conditions may become degraded. Similarly, burro and cattle grazing are not having a population-level effect to the relict leopard frog now or into the future.

Disease and nonnative fish predation have been evaluated and monitored by the Conservation Team. The presence of the chytrid fungus, *Batrachochytrium dendrobatidis* (Bd) in relict leopard