

# THE ENDANGERED KANAB AMBERSNAIL IN GRAND CANYON: ONGOING STUDIES AND MANAGEMENT ACTIONS

## A Briefing for the Glen Canyon Technical Work Group

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### Background

The final rule for federal listing of the Kanab ambersnail (KAS, Succineidae: *Oxyloma haydeni kanabensis* Pilsbry) as an endangered species was published on April 17, 1992 (U.S. Fish and Wildlife Service [USFWS] 1992). Downlisting criteria in the Kanab Ambersnail Recovery Plan (USFWS 1995) include: (1) locate and/or establish additional populations so that 10 separate populations exist with long-term viability; and (2) establish formal land management designations and/or implement land management plans that provide long-term, undisturbed habitat for the 10 populations.

Three populations of the endangered ambersnail previously existed, two in southern Utah and one in northern Arizona. One of the Utah populations apparently has been extirpated by dewatering of its habitat. Only three individuals were found during an intensive search in September 1992, and none have been observed since that time (USFWS 1992). The remaining Utah population exists on private land which the owner wishes to develop. Only the Arizona population, located at Vaseys Paradise in Grand Canyon National Park, is relatively secure from the threat of habitat degradation and loss.

KASs are restricted to spring-fed wetland habitats dominated by cattails, sedges, crimson monkeyflower, and watercress. The ambersnails exist on living or dead vegetation overlying water or wet soil. Loss and/or adverse modification of wetland habitat is considered the biggest threat to future survival of the ambersnail. (USFWS 1992). Other potential and realized threats include predation by birds (Clarke 1991) and rodents (Stevens 1997b) and infection by a trematode parasite (Stevens 1997a).

### Current Status

Studies of the Grand Canyon KAS population and its habitat were initiated in September 1994 by an interagency group of biologists (Kanab Ambersnail Interagency Workgroup [KAWG]) from the Arizona Game and Fish Department, Bureau of Reclamation, National Park Service, and Fish and Wildlife Service. The March 1996 45,000 cfs Beach/Habitat-Building Flow (BHBF) from Glen Canyon Dam resulted in the loss of more than 10% of total KAS habitat at Vaseys Paradise, mostly due to scouring and degradation by flood debris and sediment (Stevens et al. 1997b), and thus exceeded the incidental take identified by USFWS in their biological opinion on the BHBF (USFWS 1996). Mitigation of the effects of the incidental take was attempted by KAWG biologists who translocated KASs to above the flood stage (Stevens 1997b).



Recovery of the KAS population and habitat at Vaseys Paradise has been slow. Estimated time for habitat recovery is at least 1.5 years, based on evidence from the 1996 growing season (Stevens et al. 1997b). Recovery of the population is more difficult to measure, because of large seasonal and year-to-year fluctuations in numbers, coupled with difficulty in making precise population estimates.

Additional BHBFs and Habitat Maintenance Flows (30,000-33,200 cfs) are expected in the future, and will continue to impact the Arizona KAS population. In their Reasonable and Prudent Measures of the biological opinion on the 1996 BHBF, USFWS identified the need to establish or discover a second population of KAS in Arizona before additional BHBFs occurred (USFWS 1996). This provision was reiterated in the biological opinion on the November 1997 test flow from Glen Canyon Dam (USFWS 1997). In response, the U.S. Bureau of Reclamation (USBR) has committed to provide logistic support to AGFD to establish a second wild KAS population and a KAS zoological refugium (USBR 1997).

With interagency support, AGFD has surveyed and evaluated 74 sites in Grand Canyon and northern Arizona for potential establishment of additional wild KAS populations (Sorensen and Kubly 1997). Ten sites in Grand Canyon National Park were evaluated as having highly comparable biological and physical characteristics to the Vaseys Paradise and Three Lakes sites. "Keyhole Spring" (near Saddle Canyon), Roaring Springs, and Thunder River were identified as locations of optimum KAS habitat. The following sites were evaluated as more desirable (second best) KAS habitat: Saddle Canyon, Upper and Lower Deer Creek springs, 147.8 mi RR Seep, Santa Maria Spring, Lower Ribbon Falls, and Showerbath Spring. An exhaustive search of other springs and seeps in northern Arizona, most in the remote backcountry and Kanab Creek area, was conducted in 1996 and 1997. These other sites were evaluated as lower quality habitat. No additional KAS populations were found.

Recent genetics studies on four *Oxyloma* populations in Arizona and Utah by Dr. Paul Keim, Northern Arizona University, and his graduate students suggest that the taxonomic relationship among these entities is not well understood. Under existing nomenclature, two of the populations are considered to be Kanab ambersnails (Vaseys Paradise and Three Lakes, Utah), and the remaining two populations are held to be Niobrara ambersnails (*Oxyloma haydeni haydeni* Binney at -9 Mile below Lees Ferry and Indian Gardens, Grand Canyon National Park). Results from the studies reveal that the populations are genetically dissimilar, and that they may deserve to be further separated taxonomically. Until such time as this issue is resolved, existing nomenclature and protections for federally listed species are preserved.

### Proposed Objectives

Attempted establishment of one or more wild populations of KAS in Grand Canyon National Park is scheduled for 1998. Introduction and establishment of federally listed wildlife species by AGFD follows a 12-step process that involves field evaluations, completion of environmental compliance and endangered species consultation documents, and review by Arizona Game and Fish Commission (AGFC), expert biologists, involved agencies, and the public (AGFD 1987). This work is being



funded by AGFD, the Department of Interior Central Utah Project Completion Act Office, USFWS, and USBR.

The timetable to complete the AGFD 12-step process has been accelerated in anticipation of El Niño-related floods or a possible 45,000 cfs BHBF in 1998. Even if floods do not occur in 1998, AGFD will pursue KAS transplants to new establishment sites in the summer. AGFD activities and progress on recovery objectives are reported to the Kanab Ambersnail Work Group (KAWG). The final three establishment sites for KAS in Grand Canyon will be determined after environmental assessments, compliance documentation, and AGFC/agency/public review has been completed. AGFD requires funding for KAS mitigation and recovery efforts from USBR, and logistical support from Grand Canyon Monitoring and Research Center (GCMRC).

### Additional Studies

1. GCMRC awarded the 1998 monitoring of the Vaseys Paradise KAS population to SWCA Environmental Consultants. Dr. Vicky Meretsky, KAWG member and former USFWS KAS principal investigator, is the principal investigator.
2. Clay Nelson, a graduate student at Northern Arizona University, is conducting KAS research in a controlled greenhouse environment. This project, which is being funded by USBR, is in its second year and involves propagation of KAS on its primary host plants. An extension of the study may be conducted at Glen Canyon Dam, where an experimental population of KAS will be established.
3. A long-term refugium population of KAS is being established at The Phoenix Zoo (TPZ). AGFD and TPZ are currently testing propagation methods with KAS and host vegetation salvaged from Vaseys Paradise prior to the November 1997 Habitat Maintenance Flow. This effort is being funded by the CUPCA office.
4. In 1997, a genetic study was conducted of southwestern ambersnail populations (Vaseys Paradise and Three Lakes KASs, and Niobrara ambersnails [*Oxyloma haydeni haydeni* Binney] from Indian Gardens and -9 mile Lee's Ferry). This work was conducted in the laboratory of Dr. Paul Keim at Northern Arizona University and was funded by AGFD and USFWS with Heritage Fund and Section 6 Endangered Species Act dollars.
5. Dr. Larry Stevens, GCMRC, is receiving funding to examine genetic relationships among *Oxyloma* spp. over a wide geographic distribution, including some in Canada identified in the scientific literature as Kanab ambersnail. This work is being funded through GCMRC.
6. The KAWG is finalizing a flood contingency plan for Vaseys Paradise KAS, which outlines interagency coordination and mitigation efforts to reduce incidental take in the event of high releases from Glen Canyon Dam. There is no specific funding for this effort.



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