TWG
12-8-98
L. Stevens
attachment 9

Kanab Ambersnail Workshop

Purpose and Objectives of the Workshop

Current biological opinion regarding Kanab Ambersnail (*Oxyloma kanabensis*) in Grand Canyon involves a single population of snails that inhabit Vaseys Paradise. Fish and Wildlife Opinion for this snail was issued in 1994. Since that time, monitoring of the population at Vasey's Paradise has taken place regarding habitat availability population dynamics of the population. In addition collection efforts outside of Grand Canyon have been made to determine the relationship of this population to other taxa. Both genetic and morphological studies of these other populations have been conducted or on going. The results of these studies suggest that the Vaseys Paradise population have traits that are similar to other populations sampled.

In light of these preliminary findings, it has been recommended that a chaired workshop be convened that clarifies issues concerning population genetics, species definitions and approaches concerning conservation biology of this species. The purpose of the symposium would be to provide the Fish and Wildlife Service adequate information to deliver a Biological Opinion concerning the Vaseys Paradise population relative to the Kanab Ambersnail species as a whole. A result of this workshop will be to provide the Adaptive Management Program associated with the Glen Canyon Dam and the Colorado River ecosystem an understanding of how to better manage for Kanab Ambersnail in its own right and in relationship to other resources within the ecosystem. The effectiveness of this workshop and subsequent management actions relies on the support of the Adaptive Management Working Group and Technical Work Group concerning the purpose and objectives of the workshop. In particular, that Fish and Wildlife Service participate and consider the opinions and information provided by the panel participants when it formulates the Biological Opinion for Kanab ambersnail in Grand Canyon.

Specific Questions for the panel are being formulated and refined (see attached).

Workshop Dates

A suggested time frame for the Workshop is late May-early June, 1999. This is based on the current status of genetic projects and data availability, and availability of workshop members. Current recommendations for BHBF from GCMRC are that flows should not go beyond 44K cfs, and therefore do not affect previous B.O. statements. Holding a panel prior to May will likely not lead to any further clarification concerning species issues or conservation efforts regarding secondary population establishment efforts.

Workshop Make-up

The panel should be composed of:

Fish and Wildlife Representatives (2) – a regional representative and a staff member familiar with population designation and population conservation issues.

Malacologist (2)- systematists familiar with the Succinidea and the population dynamics, reproductive biology, geographic distribution and variation found within this group.

Population Biologist (2)– scientists familiar with population genetics and conservation genetics.

Biologists (2) - Scientists knowledgeable about the species itself and its reproductive/life history requirements and population variation (inter and intra population).

The following questions were reviewed by Debra Bills then provided to Barry Gold on December 1, 1998.

TONY MORTON'S suggested questions for KAS review panel:

STATEMENT: KAS taxonomy has been based on internal and shell morphology, and is being revisited through molecular genetic techniques. Within Grand Canyon, KAS has apparently been restricted to Vaseys Paradise. No KAS have been detected at more than 100 other Grand Canyon springs surveyed from 1991 through 1997. This suggests that the Vaseys Paradise KAS population, like many southwestern spring species, is a Pleistocene relict which has become restricted in distribution as Holocene climate dried out. Genetic dissimilarity with other Oxyloma haydeni populations in the Colorado River drainage further supports this contention (Miller et al. in press).

QUESTION: Does it make any difference whether we base jeopardy and take on the species using morphology or genetics? For example, if the Three Lakes, Kanab Canyon and Vaseys snails all appear to be the same morphologically, should we treat them that way? What if the genetics analyses prove inconclusive (although we do know the Three Lakes snails are genetically different than the Vaseys snails)? Is it necessary, or appropriate, to be ultra-conservative and consider the populations distinct?

STATEMENT: The following is the proposed definition of establishment of a 2nd population of Kanab ambersnail proposed by FWS on July 2, 1998:

The establishment of a new wild population of the Kanab ambersnail can be considered successful when:

> (1) the population densities, fecundity, and recruitment are similar to those of the parent population at Vasey's Paradise;
>
> (2) habitat remains suitable while accomodating environmental uncertainties including changes in weather, food supply, predators, and other factors; and
>
> (3) the trend of population growth must be positive or at equilbrium with the available habitat for a certain period of time, perhaps three (3) years.

QUESTION: Does this definition seem to fit with current knowledge about population viability for snails, or similar species? Would it be appropriate to discuss population establishment in terms of trends, ranges, or bottom-line conditions?

STATEMENT: Rematched historical photographs of Vaseys Paradise (e.g. Turner and Karpiscak 1980:58-59) reveal that vegetative cover has increased greatly at lower stage elevations since completion of Glen Canyon Dam, and that flow regulation by the dam has increased primary

KAS habitat area at Vaseys Paradise, below the pre-dam 10-year flood stage of 125,000 cfs, by more than 40%. Furthermore, all vegetation below the approximate 90,000 cfs stage was scoured by annual pre-dam floods in normal years. The KAS population has survived numerous larger floods both before and after dam construction

QUESTION: Given the pre-dam conditions that the snails have been able to survive, and the fact that available habitat has expanded by more than 40% since dam construction, would flows up to 90,000 cfs be considered a threat to the snails as a species, and would an incidental take of more than 10% of occupied habitat be considered cause for alarm?

STATEMENT: The 1994 biological opinion states:

> The KAS population also has wide seasonal and annual fluctuations. This is the only known population of the Kanab ambersnail in a wilderness setting and the survival of this population is critical to the species (U.S. Fish and Wildlife Service 1994b). Because the lower areas of Kanab ambersnail habitat can be quantified, incidental take will assume to be exceeded if more than 10% of the occupied habitat in Grand Canyon will be inundated by high flows or a controlled flood.

QUESTION: Because no other information or justification is given for establishing a 10% limit on take of occupied habitat, does 10% seem to be an appropriate limitation on take of occupied habitat, given the very high pre-dam flows and normally high overwinter mortality of snails (three years of population data indicate that the KAS population undergoes a substantial reduction through over-wintering mortality (Kanab Ambersnail Interagency Work Group 1997b). Natural winter mortality may reduce the KAS population by nearly 50%-75%))? For example, how much of the habitat or how many snails could be lost to all causes and the population still retain the ability to survive and thrive?

STATEMENT: The 1994 opinion also states:

> Monitoring following flood events will assist in defining the species' response to those events and in refining a take level.

We know that it is taking over 2 years for habitat destroyed in the 1996 Experimental BHBF to rebound.

QUESTION: How does the habitat recovery time reflect on the appropriateness of established take limits for KAS?

STATEMENT: During the 1996 Experimental BHBF, and as currently drafted in the KAS Contingency Plan, impacts to snails are mitigated by physically moving them out of harms way. During 1996, that meant moving them up above the peak flow stage, but still within Vaseys Paradise. For future actions, that could involve moving snails both higher and to other locations

within Grand Canyon, or completely out of the canyon, to refugia.

QUESTION: Is moving an endangered species an appropriate, ongoing method to protect the creatures, or is it an inappropriate precedent, too unnatural?

STATEMENT: In the draft 1999 BHBF biological assessment, it's noted that approximately 68.8 m^2 (10.5%) of the estimated total habitat will be inundated during a 45,000 cfs BHBF. This value is 0.5% more than the B.O.-specified level of habitat take of 10%. A total of 22.7 m^2 of the habitat lying below the 45,000 cfs stage in the September 1998 survey consists of mixed vegetation patches dominated by horsetail (Equisetum spp.), reed (Phragmites australis) and other species. These patches are little used by KAS, and are extremely resistant to scour, having persisted through the 1996 BHBF and the high flows of 1997 and 1998. If this area is subtracted, a 45,000 cfs flow would inundate 7.3% of the total habitat.

QUESTION: Is it appropriate to distinguish primary and secondary habitats and extent of use, or is it enough to know that the snails use it, therefore it's of critical value?

GARY BURTON'S suggested questions for expert panel regarding Kanab ambersnail - 11/16-17/98

1. Are the genetic variances in the new KAS congregations significant enough differences to change our assessment of the number of known KAS "populations"?

2. If the various KAS congregations do not accomplish genetic exchange, are they separate populations?

3. Can populations outside of AZ contribute to the 10 populations specified for downlisting?

4. What is the natural mode of spread of the species to expand its range - high flows, birds?

a. In pre-dam days, how did the Vasey's population recover/reinhabit Vasey's Paradise after extreme high flow events?

b. Being a pulmonate species, could high peak flows through the Canyon serve as a significant dispersal mode for the species?

c. Could the Vasey's population have been seeded from other locations upstream?

d. With high peak flows, could the Vasey's population seed downstream habitats?

5. In attempting to establish new populations, what period of time (persistence) or number of successful generations is reasonable to consider the population a success? Is there a population size requirement.

6. KAS appears to replace its entire population every year. Would there be long-term impacts to the Vasey's population from a 25% population loss in one year?

7. What are the critical biotic and abiotic characteristics of the Vasey's Paradise site that create unique habitat for KAS only at this location in the Canyon?