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Testimony
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United States House of Representatives

Hearing on the Silvery Minnow's Impact on New Mexico

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My name is Thomas A. Wesche. I appreciate the opportunity to testify before you on matters concerning the Rio Grande silvery minnow (RGSM) in New Mexico. My resume is attached for your review. To summarize, I am presently the Principal Scientist for HabiTech, Inc. and Professor Emeritus of Water Resources at the University of Wyoming. I have over 30 years professional experience in the western United States, including the desert southwest, as a fisheries scientist and surface water hydrologist, specializing in the evaluation and restoration of degraded river systems, the habitat requirements of various fish species, and the determination of suitable instream flow regimes to protect and restore aquatic ecosystems. In New Mexico, I have served as a member of the Biology Committee for the San Juan River Recovery Implementation Program since the mid-1990's and as a consultant for the Middle Rio Grande Conservancy District since 1999 on issues concerning the RGSM. In this latter capacity, I serve as a delegate to the Middle Rio Grande Endangered Species Act Collaborative Program (MRGESACP) Science Subcommittee and a member of the San Acacia Fish Passage Workgroup and the newly formed RGSM entrainment ad hoc group. Also, I have conducted research on physical barriers to RGSM passage and am currently initiating projects to restore RGSM habitat using large woody debris and quantify hydrologic alteration along the middle Rio Grande.

In my letter of invitation, I was asked to address several matters in my testimony. These include my views on 1) the 10th Circuit Court's ruling on Rio Grande Silvery Minnow, et al. vs. John W. Keys, III, et al.; 2) the need for additional flows to benefit the silvery minnow; 3) the underlying role of science in the silvery minnow recovery process; and, 4) the role of appropriate habitat enhancements and improved monitoring measures in the recovery process. Following are my opinions on these issues.

As my views on issues 1 and 2 are strongly intertwined, allow me to address them collectively from a scientific, not a legal, perspective. It is my understanding that the 10th Circuit Court's ruling permits the Bureau of Reclamation, acting under the ESA, to reduce contract deliveries of non-native San Juan-Chama water and use that water for the benefit of the silvery minnow. In essence, this ruling supports the notion that more water is necessary to conserve the silvery minnow and that by simply releasing more from storage, no matter the source or the probability of future supply, the species will be protected. I disagree with this viewpoint and continue to argue, as I have for the past several years, that history does not support the assertion that intermittency, river drying, and reduced flows are the principal causes for the current status of the silvery minnow. For example, if we compare the San Marcial stream flow record for the 1950 to 1972 period with that for the 1973 to 1999 period, we find that mean monthly flows are substantially higher during every month of the year and the occurrence of zero-flow days substantially lower during the more recent period, when minnow numbers have apparently declined sharply. Likewise, comparison of similar time periods using the Albuquerque stream flow record results in similar findings. While silvery minnow have apparently declined, river flows have been substantially augmented and the number of zero-flow days reduced. Hydrologic facts such as these, coupled with the more recent unsuccessful flow augmentation

efforts to maintain or enhance minnow numbers, lead me to conclude the strategy of simply releasing copious amounts of water down the middle Rio Grande channel to benefit the silvery minnow has failed. Our critically low water supply levels dictate such wasteful practices be discontinued in favor of the more holistic approach mandated by the current Biological Opinion, and now being implemented by the MRGESACP. The single Reasonable and Prudent Alternative recognizes 1) the hydrologic reality of the middle Rio Grande by differentiating stream flow prescriptions between dry, normal and wet years, 2) that river drying has occurred historically and will continue in the future, 3) that priority life functions such as silvery minnow reproduction must be protected first when water supply is short, 4) that management priority must be given to those river reaches (such as the Albuquerque reach) where flow can be provided most effectively and efficiently, while maintaining other necessary, and legitimate, water uses, 5) refugia, hatcheries, and other types of sanctuaries are necessary, at least in the shorter term, to protect and conserve the species, and 6) multiple factors, such as physical habitat degradation, poor water quality, passage barriers, and predation and competition from native and non-native species alike, have likely contributed substantially to the decline of the silvery minnow. I am encouraged by this holistic approach and hopeful we can now move past the single, divisive issue of "keeping the river wet" at all cost and on to the important business of conserving the Rio Grande silvery minnow. To this end, I am supportive of the current Biological Opinion and of legislation such as that being sponsored by Congressman Pearce in HR 2603 which provides a positive solution to the problems created by the 10th Circuit Court decision.

The third issue I was asked to address relates to the underlying role of science in the silvery minnow recovery process. Let me begin by simply saying that in my opinion, "science", and the application of the "scientific method", is the critical underpinning of the entire recovery process. As you may recall from junior high science class, the steps in applying the "scientific method" are quite simply stated: 1) observe a phenomenon; 2) develop a hypothesis to explain the phenomenon; 3) design an experiment to test your hypothesis; 4) gather your data; 5) analyze your data; and, 6) accept or reject your hypothesis based upon the conclusions drawn. On paper, it sounds pretty simple. In practice, it usually isn't, especially within the framework of a collaborative program composed of numerous signatory agencies and groups, all with diverse and often competing missions, trying to conserve a minuscule biological organism about which we know precious little that lives in a highly complex river system about which we also know precious little. Given such a scenario, how does one even attempt to proceed? Well, to avoid total chaos and hopefully to begin to make progress, we fall back, often perhaps without even knowing it, on the framework provided by the scientific method. We begin the slow, often agonizing and confrontational process of trying to work our way through those six steps. At the start, can we even agree on the phenomenon (e.g. silvery minnow are scarce), let alone on the hypotheses to attempt to explain why (e.g. water is in short supply, habitat is degraded)? Each step of the way is fraught with disagreement, mistrust, argument, and the like, as we attempt to identify probable limiting factors and ways to address them. Eventually though, with the help of outside peer reviewers and the clearer thinking that hopefully results from perhaps heated yet productive scientific debate and experimentation, management actions are implemented, monitored and evaluated leading to progress toward recovery. Unsuccessful treatments and prescriptions will be discarded or modified, while successful efforts will be documented and duplicated elsewhere. From my perspective, the MRGESACP is still in the early stages of this process. We are attempting to define complex phenomena with the short-term and incomplete data sets that we have in hand, our hypotheses are still somewhat fuzzy and untested, and our ability to draw conclusions is tenuous at best. Complex problems typically require complex solutions. Science and the scientific method provide the framework within which such complex solutions will be crafted for the middle Rio Grande.

The final issue I was asked to address concerns the role of appropriate habitat enhancements and improved monitoring measures in the recovery process. Over the past several years, I have had the opportunity to conduct four aerial reconnaissance flights over the middle Rio Grande through the designated critical habitat and have spent numerous days in the field observing habitat conditions. Based upon these observations, my review of historic records and documents, and my experience with degraded river systems throughout the western U. S., I am of the opinion that the physical habitat of the middle Rio Grande is severely degraded and recovery of the silvery minnow is questionable at best unless river-wide habitat enhancement measures are implemented. In its' present condition, much of the river is narrower, deeper, and swifter than it was historically. Habitat diversity has been substantially reduced, secondary channels have been cut-off from the main channel and lost, substrate coarsening has occurred with gravels and cobbles replacing silts and sands in many locations, and important elements of structural complexity, such as large woody debris, have been flushed from the system without replacement. The result is a substantial reduction in habitat quantity and quality for the silvery minnow. Stream flow-based solutions alone will not return habitat for the silvery minnow to the middle Rio Grande. Well-conceived, designed and implemented habitat enhancement

measures, such as those described in the Biological Opinion and now being implemented by the Bureau of Reclamation and others, are needed to re-connect the river with its' floodplain, widen the channel to promote habitat diversity, and increase overall complexity. These are high priority measures needed immediately if silvery minnow recovery is to proceed.

Monitoring of the silvery minnow population is an important component of the recovery effort. A river-wide, representative, statistically-valid sampling program yielding quantitative results is necessary to document baseline conditions, teach us more about the temporal and spatial distribution of the endangered species as well as the other members of the fish community, measure program successes and failures, and chart our progress toward established recovery targets. We need to be certain that our monitoring 1) is sampling habitats throughout the middle Rio Grande in proportion to their availability, 2) using appropriate fish collection methods, procedures and gear for all habitat types present within the river, 3) has a sampling frequency sufficient to detect seasonal distribution shifts but not so repetitive that undue sampling mortality and species behavior modifications occur, 4) is thoroughly documented and reproducible, and 5) is producing quantitative results of sufficient statistical rigor to allow valid temporal and spatial comparisons to be made and progress toward recovery to be documented. Over the past year, the Science Subcommittee of the MRGESACP has spent considerable time debating this matter. I am confidant that through these discussions, input from expert peer reviewers, and perhaps some fine-tuning, the resultant monitoring effort will meet the needs of the Program.

This concludes my written testimony.