

**Probable Effects of Proposed Groundwater Pumping
by
Southern Nevada Water Authority
in
Spring, Cave, Dry Lake and Delamar Valleys, Nevada
on
Spring and Wetland-Dependent Biota.**

**Rebuttal to Southern Nevada Water Authority July 1,
2011 Evidentiary Submission**

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INTRODUCTORY SUMMARY

Groundwater modeling submitted in evidence by GBWN (Myers 2011, GBWN Exhibits 001 through 005, and Bredehoeft 2011, GBWN Exhibit 009) demonstrate that the proposed SNWA Groundwater Development Project will result in extensive decline of groundwater level, spring discharge, and wetland area over a broad area of Eastern, Central, and Southern Nevada. BLM (2011) reaches a similar conclusion in their DEIS of the environmental effects of construction and operation of the SNWA Groundwater Development Project.

The SNWA (Exhibits 147 - 151, 363, 365-369), in defense of the Project, asserts that encroachment on pre-existing water rights and/or "unreasonable" adverse environmental effects to "Water-dependent Ecosystems" resulting from declining water tables, spring discharge, streamflow, and wetland area can be managed by modifying location and depth of groundwater wells, quantities of water withdrawn by each well, and/or management of biological resources, aquifer recharge, or by other means. They also argue that a comprehensive monitoring program will provide adequate information to guide a management program intended to avoid foreseeable environmental damage. Furthermore, if management of biological resources, or of the location, depth, and/or quantity of groundwater withdrawal or aquifer recharge does not prevent "unreasonable" environmental damage or violation of pre-existing water rights, mitigation measures will be adequate to compensate for the damage or violation.

Monitoring, Management, and Mitigation requirements, standards and "common goals" are defined in Stipulated Agreements (Exhibits SE_041, SE_080), and Monitoring Management and Mitigation Plans (Exhibits SNWA 365,366) negotiated between SNWA and agencies of the Department of Interior. In general, "unreasonable" adverse environmental effects are defined as more than a 50 foot decline of the water table, or a 15% decline in spring discharge (SNWA Exhibits 147 - 151, 363, 364-369). Mitigation is required if these "evaluation criteria" are exceeded as a consequence of SNWA groundwater pumping.

REBUTTAL

Stipulated Agreements (SE Exh 041, SE Exh 080):

Executive Committee: Stipulated Agreements provide for final decision-making by an Executive Committee ("...one manager from SNWA and one from each of the DOI Bureaus..."). In my evidentiary statement (June 29, 2011, GBWN Exhibit 014) I pointed out that, "because the agreements are structured so that final or controversial decisions are to be made by management personnel... not by scientific personnel," the long-term result will be decisions biased toward delivering water to Las Vegas, but only intermittently supportive of maintenance of aquatic habitats. Individuals occupying all of the Federal management positions represented on the Executive Committee have already demonstrated that bias. They signed and filed protests to the SNWA groundwater rights applications in Spring, Cave, Dry Lake, and Delamar Valleys, and

then later under a different Federal administration withdrew those same protests. This was done even though the following statements from their scientific personnel had been submitted as evidence in support of the protests:

- FWS exhibit 501 recommended “denial of applications for Dry Lake and Delamar Valleys,”
- FWS exhibit 598 noted the existence of 6 globally critically imperiled, 1 globally imperiled, and 1 endemic springsnail species in project basins and adjacent, down-gradient basins, the scientist pointed out that the "U. S. Fish and Wildlife Service, U. S. Bureau of Land Management, National Park Service, U. S. Forest Service, Smithsonian Institution, and The Nature Conservancy signed a Memorandum of Understanding (MOU) that formally recognized the importance of conserving the springsnail fauna of the Great Basin,"
- FWS exhibit 559 states that “any alteration to its water sources would affect every aspect of the Refuge's [Pahranagat National Wildlife Refuge] ability to support life,” and
- FWS exhibit 609 states "In conclusion, alteration and reduction of habitat has already caused unforeseen extinction and endangerment of endemic fishes along the course of the Pluvial White River. Further habitat reduction would be expected to cause more extinctions and loss of Nevada's unique fish fauna."

It is also important to note that protests to the SNWA applications for water rights by agency managers (who in the future will be serving on the Executive Committee) were withdrawn in spite of the fact that all of the fish species referred to in FWS Exhibit 609 are extinct, listed as endangered, or have been considered for listing. In addition, Deacon et al., appendix I (2007) identified 20 endangered or threatened wetland-dependent species (11 of them on Specially Designated Federal Lands) and an additional 137 spring-dependent species occurring in the area likely to be adversely affected by the groundwater project. CDD Exhibit 1140.

The above facts leave no doubt but that approval of the SNWA applications for groundwater rights in Spring, Cave, Dry Lake, and Delamar Valleys will lead to loss of springs, streams, wetlands (required habitat for federally listed species), and population reductions of federally listed species, as well as damage to public interest values specifically listed below in the Monitoring, Management, and Mitigation section of this report.

Funding: SE_Exh_041 and SE_Exh_080 (page 9, number 15) state: “Any commitment to funding by the DOI bureaus or the SNWA in the stipulation, including specifically any monitoring, management, and mitigation actions provided for in Exhibit A is subject to appropriations by Congress or the governing body of the SNWA as appropriate.”

This provision virtually guarantees a very short life span for the Monitoring, Management, and Mitigation program. Public funding for any program is notoriously

short-term. The consequence is that the program cannot possibly achieve the "common goals" to which it aspires, nor prevent "unreasonable" environmental damage.

Monitoring, Management, and Mitigation (SNWA Exh 365 and SNWA Exh 366):

The Monitoring, Management and Mitigation Program as described in the Stipulated Agreements will not accomplish the "common goals," nor prevent "unreasonable" environmental damage, nor will it protect most public interests in the water or the habitats they support. Under some specialized circumstances the Program may protect some Special Status Species (i.e. such as those currently living in artificial habitats), and some other narrowly defined Federal or non-federal public interests (i.e. such as delivery of water for consumptive use to public facilities) or some Private interests. Public and private interests in ecosystem services are either not protected, or are insufficiently protected. These interests include such things such as water and habitats that support wildlife, recreation, hunting and fishing, rural lifestyles, future opportunity for rural Nevadans, agriculture, domestic animals, scientific discovery, nutrient cycling, biodiversity, state and federal wildlife management areas, state and federal refuges, migratory birds, etc. The focus on "unreasonable," "evaluation criteria," "common goals," and "Special Status Species," permits the habitat with its complex physical, chemical, and biological interactions and relationships essential for maintenance of functioning, healthy ecosystems to be discounted or ignored.

Monitoring:

Monitoring is structured primarily to provide information about declining groundwater tables and declining spring discharge, streamflow, or wetland area that may affect Federal interests. This focus, while appropriate for some spring, stream, or wetland-dependent federal, non-federal, and private interests such as Special Status Species, will not prevent or minimize damage to private and/or public interests other than presently recognized Federal ones. In fact, even many Federal interests are left in jeopardy by the Monitoring, Management, and Mitigation Programs because of the "time to full capture" and/or the "response time" problems described respectively by Bredehoeft and Durbin (2009) and Walton (2011). Monitoring of surface water habitats (springs, streams, and wetlands), and the Special Status Species they support may identify problems that will become worse with time as the cone of depression expands. This is true because even complete cessation of groundwater pumping cannot reverse the consequences of groundwater withdrawal. The result is that, by the time a groundwater supply problem is identified for a Wetland-dependent Ecosystem, increasingly dire problems cannot be prevented. For example, Myers' (2011) groundwater model suggests that, if groundwater pumping in Spring Valley is stopped entirely after 200 years of pumping at rates for which SNWA has applied, spring discharge at Big Spring in Snake Valley will continue to decline for an additional approximately 150 years.

Monitoring of Special Status Species will not identify undescribed, undesignated, or unknown species. It is virtually certain that many undescribed wetland-dependent species exist in the area of probable impact. For example: A previously unknown and still undescribed sculpin (White River sculpin) exists in the upper few meters of

Sunnyside Creek in White River Valley (e-mail from Gayton Scoppettone, US Fish and Wildlife Service, Reno, June 20, 2011), four new species of cave-adapted invertebrates have been described from Great Basin National Park since 2007 (Taylor and Holsinger 2011), Herschler (1998) described 58 new, previously unknown species of springsnails from the Great Basin, a recent scientific paper describes the high probability that many new species of amphipods will be recognized throughout the Great Basin in coming years (Witt et al. 2006).

Management:

When management is required because of a predictable impact to Wetland-dependent Ecosystems or Special Status Species, correcting the threat can only be successful if habitat size, spring discharge, streamflow, wetland area, wetted perimeter, exotic species, and other microhabitat characteristics can be stabilized or reversed. The long response times referred to above therefore doom most management efforts.

The very specific microhabitat requirements characteristic of springsnails (Ponder et al. 1989, O'Brian and Blinn 1999, Mlandeka and Minshall 2001, Sada 2008), dependence of endemic fish species in Ash Meadows, and in White River, Pahranaagat, and Moapa Valleys on volume of flow for foraging success (Scoppettone et al. 1992), their narrow range of temperature tolerance with attendant susceptibility to waters that cool more rapidly as flows diminish (Scoppettone et al. 1992, Scoppettone and Rissler 2002), their susceptibility to introduced species (Minckley and Deacon 1968), severe recent restriction and therefore disconnection of habitats (Scoppettone et al. 2004), indicates low probability of predictable response by springsnails or fish to management actions. While other groups have not been examined as thoroughly, there is no reason to suspect this is a unique characteristic of springsnails or endemic fish.

Mitigation:

Mitigation or mitigation banking is triggered if management is inadequate to solve the problem identified by the monitoring program. Mitigation requirements include measures "designed and calculated to... repair or replace... Water Dependent Ecosystems... to achieve the Common Goals..." (SNWA Exhibit 363). "Replace" as used here makes it obvious that Common Goals can be considered met by building artificial habitats. This is specifically suggested for Shoshone Ponds in SNWA Exhibit 363 (page 8-2). Under certain specialized circumstances, this may be a valid option (i.e. for some Special Status Species currently living in artificial habitats). However, natural ecosystems cannot be "replaced" because all components and interactions of any given ecosystem are not known and therefore cannot be duplicated in other artificial or natural habitats.

Habitats not containing Special Status Species or natural habitats supporting biodiversity that may yet be unknown, undescribed, or undesignated are even more likely to be considered expendable or candidates for "mitigation" by creating artificial aquatic habitats. For those species, "mitigation" is equivalent to extinction because maintenance of intact ecosystems is impossible if the habitat supporting those ecosystems no longer exists. Furthermore, unknown species, precisely because they

are unknown are not likely to be moved. Undescribed or undesignated species may or may not be moved and are unlikely to be "Special Status Species."

These facts ensure that mitigation and mitigation banking will, except for a few specialized circumstances, produce results not in the "public interest."

CONCLUSIONS

1. Stipulated Agreements and the Monitoring, Management, and Mitigation Programs established by them will not protect the "public interest," accomplish the "common goals," or avoid "unreasonable" adverse environmental effects of proposed groundwater pumping by SNWA in Spring, Cave, Dry Lake, and Delamar Valleys.
2. The Executive Committee, as defined in Stipulated Agreements, assures that long-term decision-making will be biased toward water delivery to Clark County and against maintenance of biodiversity and surface water habitats with their attendant public interests and water rights.
3. "Unreasonable" environmental damage and most public interests are not protected by the Stipulated Agreements or the Monitoring, Management and Mitigation Program.
4. The Executive Committee over the long term will make decisions biased toward delivering water to Las Vegas and against protecting the public interest.
5. Springs, streams, and wetlands in the area affected will decline to the detriment of the public interest values they serve.
6. Dependence of the Monitoring, Management and Mitigation Program on federal appropriations or SNWA funding guarantees a short life span of a program presented as a long-term, sustainable program.
7. Some Special Status Species and some Federal, Private, non-federal public and private interests can be protected by the Monitoring, Management, and Mitigation Program.
8. Most public and private interests in ecosystem services such as wildlife, recreation, hunting and fishing, rural lifestyles, future opportunity for rural Nevadans, agriculture, domestic animals, scientific discovery, nutrient cycling, biodiversity, state and federal wildlife management areas, state and federal refuges, migratory birds, etc. will not be protected.
9. Because aquifer response time ("time to full capture" or "response time") is a fact, hydrologic monitoring will be capable of identifying surface water ecosystem issues (involving either Special Status Species or groundwater dependent ecosystems) that, after cessation of pumping, can only get worse before they improve.
10. The Monitoring program will not be able to monitor unknown components of the habitat.

11. The unique characteristics of wetland dependent ecosystems and specificity of microhabitat requirements of species dependent on them, severely restricts the likely success of the management program.
12. Heavy dependence of the mitigation program on "replacement" of water dependent ecosystems is not an appropriate, effective, or satisfactory response to the problem. Natural ecosystems cannot be replaced because all of their components and interactions are not known. It may be appropriate to substitute one artificial habitat for another.

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