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September 16, 2011

Dr. Marty Kelly, Ph.D
Ecologic Evaluation
Southwest Florida Water Management District
7601 U.S. Highway 301
Tampa, FL 33637-6759

Re: Proposed Minimum Flows and Levels for the Gum Slough Spring Run – Peer Review Draft

Dear Dr. Kelly:

The Florida Fish and Wildlife Research Institute of the Florida Fish and Wildlife Conservation Commission (FWC) has coordinated our agency's review of the Southwest Florida Water Management District's (SWFWMD) Proposed Minimum Flows and Levels (MFLs) for the Gum Slough Spring Run draft report and provides the following comments and recommendations.

SWFWMD summary of MFL approach

The Gum Slough Spring Run is located in northwest Sumter and southern Marion counties. The run discharges into the Withlacoochee River approximately mid-way between SR 44 and Hwy 200. The system lies in a primarily undeveloped area with the majority of land adjacent to the run being composed of intact wetland forests. Although much of the northern portion of the watershed is urban land use, the Marion Oaks subdivision, which was sub-divided in the 1960s, contains many undeveloped lots and parcels of vacant land.

The Gum Slough Springs Group is made up of numerous springs including Gum Spring Main, Gum Spring 1, and Alligator Spring in the headwaters, and Gum Springs 2, 3, and 4 as you proceed downstream. The combined discharge from the entire system, which includes overland flow, has a mean daily discharge of 98 cubic feet per second (cfs) making it a large second magnitude system.

Due to the low intra-annual variation in discharge, seasonal blocks typically utilized by the SWFWMD for river MFLs were not used. The MFLs include prescribed flow reductions as well as a low-flow threshold. The low-flow threshold is defined to be a flow that serves to limit surface water withdrawals, with no surface water withdrawals permitted when the threshold is exceeded. The low-flow threshold, for the U.S. Geological Survey (USGS) Gum Springs gauge near Holder, was determined to be 35 cfs and was based on the lowest wetted perimeter inflection point and fish passage. A prescribed flow reduction for the entire year was calculated to be 9%. The prescribed flow reduction was based on Physical Habitat Simulation Modeling.

Comments and Recommendations

Overall, we find that the Southwest Florida Water Management District has done a commendable job of addressing the elements necessary for developing an instream flow standard. The available data were well examined and additional data were collected as needed to support the SWFWMD's objective of maintaining the natural flow regime for biota and ecosystem function, while meeting the needs of human uses. We agree with the SWFWMD's assumption that sustaining the components of the natural flow regime to the best extent possible will preserve ecological functions and processes, without fully understanding the individual requirements of all fish and wildlife. Although we support the SWFWMD's typical use of the seasonal building block approach in most MFL prescriptions, we understand why this approach was not used and conclude that the decision to forego this method was well supported. We further commend the selection of ecological and biological factors considered in Gum Slough and the use of the most conservative of these factors to determine the low flow threshold and prescribed flow reduction. We believe that the overall analysis is scientifically sound, and should therefore be protective of fish, wildlife, and their habitats, despite a relatively small hydrologic period of record. Because the SWFWMD's approach has remained relatively consistent through other MFL water body prescriptions, and many of our remarks have been addressed in those drafts, only a few specific comments concerning this prescription follow below.

Page 7-13. The first paragraph states "*the District developed additional habitat suitability curves for species of interest. Type III curves have been refined for the spotted sunfish and new Type III curves have been developed for species representative of various fish guilds including shallow-fast (SF) guild and deep slow (DS) guild.*" A brief explanation, perhaps best placed in your appendix, of how these guild Habitat Suitability Curves (HSCs) were developed would be helpful. As an example, were shallow-fast locations sought and sampled and velocity/depth/cover measurements taken from those locations? If so, this seems circular in that the species pertaining to the shallow-fast guild were species collected in shallow-fast locations, and the limiting factor may only be the cover associated with those locations. Or, were locations randomly sampled across all velocity/depth/cover possibilities, and then the guilds were partitioned based on all data? Guilds are informative if the species in those groups exhibit a discrete use of the guild characteristics (e.g., fish species associated with shallow-fast locations are less suited to other depth/velocity combinations), and loss of those characteristics could thereby cause harm to the species population or life history. It would seem that most of the species in Gum Slough can belong to all guilds and might therefore minimize the significance of any preference. As such, habitat gains or losses through flow reductions may not be terribly important to a composite group of species if they are represented in the remaining guilds. Alternatively, did the evaluation use guilds to simply note that those habitats are used by a variety of species and are worthy of protection. One example might be that although redbreast sunfish could belong to all guilds, only juvenile redbreast sunfish were associated with the shallow-slow guild, and consequently protection of this guild habitat ensures recruitment to adulthood. A brief explanation or reference of how these guild HSCs were developed and why they are important would be helpful.

Page 7-15. Last paragraph, "*Simulations were conducted for various life-history stages of spotted sunfish, largemouth bass, bluegill, shallow-fast (SF) fish guild, deep-slow (DS)*

fish guild, and for macroinvertebrate diversity at all four sites on the Gum Slough Spring Run." This sentence implies that only these two guilds were examined. We recommend that the SWFWMD consider including the other two guilds (shallow-slow and deep-fast) listed in Table 8-1, or restructure the sentence to state various fish guilds.

In addition to these comments, several listed species and a wading bird nesting location are known to occur within a five-mile buffer to Gum Slough Spring Run. The listed species include gopher frog, *Rana capito*, State-listed Species of Special Concern (SSC); American Alligator, *Alligator mississippiensis*, Federally Threatened (FT); Florida scrub jay, *Aphelocoma coerulescens*, (FT); limpkin, *Aramus guarauna*, (SSC); plume polypody, *Polypodium plumula*, State Endangered; and cardinal flower, *Lobelia cardinalis*, State Threatened. However, given that the proposed low-flow threshold and the prescribed flow reduction will not substantially deviate from the natural flow regime, and that the impact to the flow record attributable to groundwater pumping was accounted for in the analyses, we don't foresee any impact to the fish and wildlife species as a result of the proposed MFL. However, we recommend that the Department of Agriculture and Consumer Affairs be consulted regarding the listed plant species.

If you or your staff would like to coordinate further on the recommendations contained in this report, please contact me at 850-617-9561, or email me at tom.champeau@myFWC.com, and I will be glad to help make the necessary arrangements. If your staff has any specific questions regarding our comments, I encourage them to contact Mr. Eric Nagid at (352) 955-3220 x102 or email at eric.nagid@myFWC.com.

Sincerely,



Tom Champeau, Director
Division of Freshwater Fisheries Management

tc/tw/en
ENV 1-12-2

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cc: Ms. Carolyn Voyles, DEP Office of Water Policy,
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Mr. Jason Hood, SWFWMD Ecologic Evaluation,
Jason.Hood@swfwmd.state.fl.us
Mr. Marty Hale, FWC-Ocala, marty.hale@myFWC.com

District Responses to FWC Comments

FWC: Page 7-13. The first paragraph states "the District developed additional habitat suitability curves for species of interest. Type III curves have been refined for the spotted sunfish and new Type III curves have been developed for species representative of various fish guilds including shallow-fast (SF) guild and deep slow (DS) guild." A brief explanation, perhaps best placed in your appendix, of how these guild Habitat Suitability Curves (HSCs) were developed would be helpful.

As an example, were shallow-fast locations sought and sampled and velocity/depth/cover measurements taken from those locations? If so, this seems circular in that the species pertaining to the shallow-fast guild were species collected in shallow-fast locations, and the limiting factor may only be the cover associated with those locations. Or, were locations randomly sampled across all velocity/depth/cover possibilities, and then the guilds were partitioned based on all data? Guilds are informative if the species in those groups exhibit a discrete use of the guild characteristics (e.g., fish species associated with shallow-fast locations are less suited to other depth/velocity combinations), and loss of those characteristics could thereby cause harm to the species population or life history. It would seem that most of the species in Gum Slough can belong to all guilds and might therefore minimize the significance of any preference. As such, habitat gains or losses through flow reductions may not be terribly important to a composite group of species if they are represented in the remaining guilds. Alternatively, did the evaluation use guilds to simply note that those habitats are used by a variety of species and are worthy of protection. One example might be that although redbreast sunfish could belong to all guilds, only juvenile redbreast sunfish were associated with the shallow-slow guild, and consequently protection of this guild habitat ensures recruitment to adulthood. A brief explanation or reference of how these guild HSCs were developed and why they are important would be helpful.

District: Discussion was expanded to better explain how these HSCs were developed and why and how the District utilizes them.

FWC: Page 7-15. Last paragraph, "Simulations were conducted for various life-history stages of spotted sunfish, largemouth bass, bluegill, shallow-fast (SF) fish guild, deep-slow (DS) Dr. Marty Kelly Page 3 September 16, 2011 fish guild, and for 'macroinvertebrate diversity at all four sites on the Gum Slough Spring Run." This sentence implies that only these two guilds were examined. We recommend that the SWFWMID consider including the other two guilds (shallow-slow and deep-fast) listed in Table 8-1, or restructure the sentence to state various fish guilds.

District: Sentence restructured to reflect the fact that analyses were conducted for shallow-slow and deep-fast guilds as well as the ones previously listed in the sentence.

FWC: In addition to these comments, several listed species and a wading bird nesting location are known to occur within a five-mile buffer to Gum Slough Spring Run. The listed species include gopher frog, *Rana capito*, State-listed Species of Special Concern (SSC); American Alligator, *Alligator mississippiensis*, Federally Threatened (FT); Florida scrub jay, *Aphelocoma coerulescens*, (FT); limpkin,

Aramus guarauna, (SSC); plume polypody, *Polypodium plumula*, State Endangered; and cardinal flower, *Lobelia cardinalis*, State Threatened. However, given that the proposed low-flow threshold and the prescribed flow reduction will not substantially deviate from the natural flow regime, and that the impact to the flow record attributable to groundwater pumping was accounted for in the analyses, we don't foresee any impact to the fish and wildlife species as a result of the proposed MFL. However, we recommend that the Department of Agriculture and Consumer Affairs be consulted regarding the listed plant species.

District: Gopher frog (*Rana capito*) and Florida scrub jay (*Aphelocoma coerulescens*) are upland species and considered non-related to MFLs. Although found extensively throughout the United States, *Lobelia cardinalis* is a Species of Special Concern in Florida. Native to Florida, the cardinal flower is found in floodplain forests and spring runs (University of Florida, IFAS 2011). District staff visited the Gum Slough Spring Run to analyze the location of the Cardinal Flower. It was rooted in the run in 12 to 18 inches of water (emergent). Based on these findings and the potential impacts if all water allowable under the MFL was allocated, the Cardinal Flower would not be impacted. Although the District did not specifically identify plume polypody (*Polypodium plumula*) along the run, Florida Natural Areas Inventory (FNAI) states that they are often found in strand swamps and wet woods. As potential impacts to the Gum Slough Spring Run in the future are projected to be due to groundwater withdrawals, the baseflow could possibly be impacted. It is not anticipated that overbank flows or overland flows, caused by heavy rainfall, will be impacted by groundwater pumping; thus *Polypodium plumula* should not be impacted by the MFL. Limpkin (*Aramus guarauna*), as described by FNAI, are known to utilize spring and spring run habitats and have been observed by District staff along the Gum Slough Spring Run. As the MFL is designed to prevent significant harm by protecting instream and adjacent floodplain habitats, the District does not foresee any impacts to nesting or feeding grounds for the Limpkin.

Literature Cited

University of Florida, IFAS 2011, Center for Aquatic and Invasive Species. Retrieved from <http://plants.ifas.ufl.edu/node/237>.