

Instream Flow Needs and Reservoir Elevation Workgroup Meeting

August 10, 2006

8 am – 12 noon

Participants:

Mike McLeod – Virginia Department of Environmental Quality

Matthew Chan – Normandeau Associates

Laura Bullard – citizen

John Kauffman – Virginia Department of Game and Inland Fisheries (VDGIF)

Brian Watson – VDGIF

Mike Pinder – VDGIF

Paul Angermeier – Virginia Tech

John Smith – Federal Energy Regulatory Commission (FERC)

Rick Roth – Friends of the New River

Jay Wylie – Devine Tarbell and Associates (DTA)

Kristi Miller – DTA

Ty Ziegler – DTA

Jon Magalski – American Electric Power (AEP)

Larry Bandolin – citizen

Bill Kittrell – VDGIF

John Copeland – VDGIF

Teresa Rogers – Appalachian Power Company

Teresa Rogers – Appalachian Power Company, began the meeting with reviewing the goals of the workgroup meeting.

- 1) Identify specific modifications to proposed study plans.
- 2) Ensure there is a nexus for any proposed changes that are to be incorporated.
- 3) Identify where more details on specific methodologies need to be included in the plans.
- 4) Come to agreement on proposed study plan / revisions.

Ty Ziegler of Devine Tarbell & Associates (DTA) reviewed the study objectives.

Range of different flow scenarios will be reviewed as part of the instream flow needs. Scenarios include peaking, run-of river and scenarios in between.

Clarification: Current flow regime is what USGS streamflow gauges are picking up now. The unregulated flow regime would exist if the dam wasn't there.

The term incremental is key. Incremental – looking at flows over the range of the hydrological record in increments. Need a tool that can evaluate at any steady state flow conditions that are of interest.

Note: DTA's objectives in the presentation are rearranged differently than what is in the proposed study plan.

Comment: Seasonality of the long term hydrology records needs to be incorporated. Trends including long term, annual, seasonal, and monthly need to be evaluated.

Comment: USGS stream gauge records prior to dam construction are available and should help in determining the unregulated hydrology record.

Comment: Need to look at incremental changes in other things such as the time series analysis. Dry years vs. wet years.

Comment: Need to be able to look at how flows affect water quality.

Comment: Withdrawals outside of the project boundary need to be evaluated.

The scenario of running for 3 hrs followed by no flow for 3 hrs. If this is something that you want to look at then we need to make sure that the tool can evaluate this.

Comment: Need to look at ramping rates.

Comment: Hydrological records are in daily averages – how will fluctuation be impacted by instantaneous changes in discharges? Hydro has hourly discharge data and most USGS gauges collect data in hourly time increments or smaller.

What are the target species and life stages that need to be evaluated? This decision needs to be made in the early stages of the study.

Comment: Biological response vs. flow changes - We don't necessarily have information on biological response for a particular species and life stage. FERC commented that some relicensing outcomes have incorporated an adaptive management plan. FERC would still need justification for setting the starting point and IFIM tools and results analysis are typically used for this.

Comment: Need a literature review of the data on biological response for species to see what is available.

Comment: Natural flow regime – can you assume that unregulated regime is what is best? Start with that assumption and go from there? Response: Because the dam has been there for so long, the existing aquatic ecology has developed over a long period of time. Also, there are introduced species and recreational boaters to consider.

Comment: Need to identify the key issues in order to select the proper tools for the study.

DTA provided a presentation about IFIM Tools for common understanding:

IFIM – Instream Flow Incremental Methodology (key is incremental)

It is a way to relate changes in river flow to changes in the amount of physical aquatic habitat that is available. More flow does not always mean more habitat. Aquatic habitat is usually defined as an area per length of stream. These models can handle lots of different species and life stages.

Aquatic Habitat – What is important? Typically depth, velocity, substrate, cover, food availability, predators, water quality, and water temperature.

PHABSIM only considers depth, velocity, substrate and cover.

PHABSIM – stands for Physical Habitat Simulation Model

IFIM tells you the amount of physical habitat that is available – it won't tell you if the fish will use it.

This tool has been widely used and accepted in FERC relicensings throughout the country.

Weighted Usable Area (WUA) is a measure of physical habitat that is available at a given flow for a given species and life stage.

Habitat Suitability Index (HSI) curves are incorporated into the PHABSIM model for each species and life stage being evaluated. HSI scales range from 0 to 1 with 0 indicating no preference and 1 indicating maximum preference.

Comment: May need to develop HSI curves for some species – where you have to collect the data. Response: It may take several years to develop data. Instead of collecting new or site specific data, another similar species, or surrogate, could be used. Alternatively, a guild could be used to represent the species. HSI curves can also be modified based on information from experts in the field. In addition, an uncertainty analysis can be run to determine how sensitive the species / life stage is to changes in depth, velocity, substrate, and cover.

Substrate / Cover Code – needs to be developed and agreed upon. Can be customized to the river.

Comment – The most important thing is the population vs. flow and there isn't much information out there for this. Can you provide any existing information for consideration before finalizing the study plan?

Initial List of Species

Smallmouth bass

Rock bass

Big mouth chubb

Green side darter

Log perch

Silver shiner

Northern hog sucker
Channel and flathead catfish
Crayfish
Macro invertebrates (mayfly, stonefly, caddisfly)
Mussels?
Recreation?

Before the next meeting, DTA will research literature to see if there are curves for the list of species above and also identify if no data exists, or is not readily available.

Comment: Flow vs. population data is important in order to characterize the response of the population to changes in flow. This will tell us the range of sensitivity of various critters to flow.
Response: It is not anticipated that we will be able to find much information on population response to flow for the New River.

Comment: The following rare species should be added to the list above – hellbender salamander and green floater mussel.

How do you start IFIM Study?

- 1) Study design – developed by stakeholder team.
- 2) River Reconnaissance – upfront reconnaissance by low altitude pictures or video, river float trip, driving to accessible points, etc. (photos and videotape can be shared with other study groups.)
- 3) Habitat Weighting – gives frequency of the different stream features (pool, riffle, run, etc.) – helps identify number and location of transects that may ultimately be needed.
- 4) Transect selection – review video to preliminarily scope out locations and number of transects. Groundtruthing, via a site visit, and consultation with stakeholder group to make sure everyone is in agreement.
- 5) Flow measurements – depth, velocity, substrate measurements are taken in each cell along a transect. Velocities are typically measured manually or with an Acoustic Doppler Current Profiler (ADCP).
- 6) PHABSIM the model – physical habitat simulation model. Works on a cell-by-cell basis for depth, velocity, and substrate/cover and also incorporates the HSI curves.
- 7) Time Series Analysis. Taking into consideration the hydrology record and the periodicity of the HSI curves. Habitat duration curves are developed and the Interactive Time Series spreadsheet takes all of the curves and brings them together on one spreadsheet.
- 8) Results presentation. All results including hydrology records, WUA curves, HSI curves, habitat duration analysis, dual flow analysis, etc. are provided to the stakeholder team.
- 9) Flow Negotiations. The Interactive Time Series tool can be used during stakeholder team meetings to evaluate different flow regimes in a group setting to come up with desired flow recommendations. It can also be used to evaluate flow regimes proposed by other study groups such as recreation and water quality.
- 10) Study report. Captures and summarized the background, objectives, study methodology, analysis, results, and flow recommendations.

Flow recommendations resulting from the IFIM study are part of the answer, but not the entire answer. Need to also take into account results from other studies such as recreation, water quality, aesthetics, etc.

Comment: The various groups represented on the stakeholder team need to bring information that they have to the table.

Comment: There are no notes being taken on the board. How are all these comments being addressed? What is the purpose of the workgroup? There doesn't seem to be consensus.

Response: Appalachian is taking notes and these will be provided to the group. The purpose of these workgroup meetings is for everyone to discuss the proposed studies so that we can all have a better understanding of what is needed. The goals of this meeting were provided at the start of the meeting. (Goals were read again to the group.) For next meeting, a handout will be provided with an outline of the purpose of the workgroup so everyone is aware. The workgroups will stay together throughout the relicensing process to discuss study results and meet at key decision points in the process.

IFIM PHABSIM –

Comment: There may not be a need to do the full IFIM study. There is a concern that 95% of the resources would be dedicated to the IFIM study with only the last 5% going towards answering the rest of the questions on population response to flows.

The group was asked: What do you want to know from this study? What questions are we trying to answer?

Comment: What is the population effects of the various flows?

Comment: How big do you expect the changes in your flow regime to be? Frequency of floods and low flows are important.

Comment: Information that individual stakeholders have will be useful for validating model results.

Comment: We want to know population response not just numbers.

Comment: Need to add into the study plan the process that will be used to determine number of transects, consultation on individual transect and their locations, etc.

Comment: Natural Heritage of the Commonwealth of Virginia information is needed for HSI curve development.

It was asked: "What are the problems?"

Comment: Smallmouth bass recruitment - peaking during the summer months may result in stranding problems (i.e., dropping flow too quickly). Other species may have this problem.

Sunfish populations are down because of drought years. Big mouth chubbs build nests along stream margins that may be affected by fluctuating flow conditions.

FERC asked about the concept of “Experts” – Panel of experts include VDGIF, consultants, and volunteer experts. Comment: This group is not all inclusive. Response: If groups or agencies want to bring other parties in, it is their responsibility to contact them.

Comment: FERC will probably want data from IFIM type study – they have to have this information to form the basis for a flow recommendation. Tools that are developed by the IFIM study team may also be useful to other study groups. Indicators of Hydrologic Alteration (IHA) methodology can also be included as part of an IFIM study.

Comment: Demonstration flows can also be utilized to get a feel for what a recommended future flow regime may look like.

Comment: Another way to come up with flow recommendations is to have workshops such as those promoted by the Nature Conservancy.

Action Items For Next Meeting:

DTA will perform a literature review to find information on existing HSI curves for species identified today. If no information is available for a particular species, that will also be identified and discussed at the next meeting.

Appalachian will bring information on purpose of workgroup.

Participants should come prepared to identify specific flow-related issues and any additional aquatic species / life stages of concern.

Next meeting – August 24 (Thursday) – 9:00.