

Issue Action Group: E10 Weiss Bypass Work Group

Meeting Summary: Marriott Birmingham July 16, 2002

Draft 07-30-02

Agreements & Resolutions

- 1) The Weiss Bypass work group should be a small, very focused group that concentrates its efforts on ecological resource issues pertaining to flows in the Weiss Bypass Reach.
- 2) Outside experts will be brought in as deemed appropriate by work group members.
- 3) The spreadsheet of aquatic habitat preference information for fish detected in the Weiss Bypass will be very helpful in analysis of flows. This same type of information will be developed for mussels that inhabit the Weiss Bypass.

Meeting Notes

These notes summarize the major items discussed during the meeting and are not intended to be a verbatim transcript or analysis of the meeting.

Weiss Bypass Field Trip Notes

Henry presented draft field trip notes for the June 10, 2002 flow observations in the Weiss Bypass to the IAG work group for comment. During this field trip, participants observed a spill of 540-cfs into the Weiss Bypass. Participants floated the entire length of the bypass and took pictures and measurements similar to previous field trips. Field trip participants also discussed the need to gather additional information on aquatic habitat preferences for fish and mussel species. The trip notes will be revised and distributed to the E10 IAG.

Weiss Bypass Work Group Membership

Work group members expressed a desire to expand the membership to include one or more riverine specialists (Scott Mettee, Pat O'Neil, Elise Irwin, or Mary Freeman) as well as mussel experts (Jeff Garner – ADCNR). These resource experts could assist the group as needed. Jim Crew will contact the identified specialists to explain the work group needs and to check on their availability to participate.

Agency Management Goals

The ADCNR restated the goal that they had introduced previously at the May 22, 2002 E10 IAG meeting and reminded working group members that this was a working draft.

“Goal: To ensure that sufficient quality and quantity of water is provided in such a manner as to resemble the natural historical riverine flow regime. This flow regime shall provide aquatic habitat conditions that support a diversity of endemic aquatic species (including fish, plants, mussels and other invertebrates) and their life cycle requirements. As a function of the natural flow regime both intra- and inter-annual variations of flows

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shall be implemented to sustain biological diversity and a balanced community of organisms.”

Carl Couret provided the USFWS’ management goals in an e-mail on 6-14-2002:

“The FWS' primary objective in the Weiss By-pass Channel is the restoration and improvement of riverine habitat in this 22-mile reach. Riverine habitat restoration/improvement efforts should eventually result in increasing the ranges, abundances and diversities of most riverine-dependent species to levels that approach their historic conditions in most of this reach. Of particular interest is the potential to enhance federally protected species (*e.g.*, mollusks) and migratory fishes (*e.g.*, striped bass, walleye, and redhorses) within this bypass reach. Other goals for this reach include improving water quality, recreational fisheries, and public access (*e.g.*, boat ramps, footpaths, fishing pier, and parking).”

Weiss Bypass Habitat Preference Spreadsheet

The work group was presented with a draft spreadsheet highlighting the life/habitat requirements of fish species previously collected and/or documented in the Weiss Bypass. The group reviewed the spreadsheet and agreed that further refinement and development of the indicators would help make this a valuable management/decision-making tool. Several suggestions were made to improve the spreadsheet including:

- adding location information,
- utilizing information from previous reports (Irwin & Stewig),
- converting all measurements from metric to English and
- improving the general format of the document.

The work group also requested that a similar spreadsheet be prepared for mussel species in the Weiss Bypass.

HEC-RAS Model

APC is continuing to calibrate the HEC-RAS model. Survey data from 16 additional transects was collected in July and added to the model after the June 10, 2002 bypass field trip. The addition of these transects was necessary to calibrate the model to the level of accuracy needed by the IAG for analysis and decision-making. APC anticipates that calibration of the “steady-state” model will be completed with some preliminary results available by late August.

Ashley McVicar distributed a handout of several graphics depicting various test flows and associated flow velocities and water surface elevations.

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Seasonal Fluctuations

During the May 22, 2002 E10 IAG meeting, IAG members expressed an interest in seasonal and annual flows releases into the Weiss Bypass that would mimic natural inter- and intra- annual variations in flows. At that time, the IAG members agreed that this would be a challenging task and that all alternatives would be considered as everyone was unsure on how this goal might be accomplished.

Ashley McVicar and Bill Sim presented a draft method for mimicking natural inter- and intra-annual variations in flows. Bill noted that the existing flow in the Weiss Bypass below Terrapin Creek is sustaining populations of mussels and other fish species. Based on this observation, Bill proposed that the work group should consider a minimum flow release into the Weiss Bypass that 1) does not drastically alter existing conditions below Terrapin Creek, and 2) mimics those sustaining conditions in the Weiss Bypass upstream of Terrapin Creek.

APC proposes to use historical flow duration data and real time flow data from the USGS Mayo's Bar stream gauge in conjunction with Terrapin Creek historical flow data to determine inter- and intra- annual variations in minimum flows releases through the Weiss trash gates (see example below).

Mayo's Bar Flow Duration

Month = Jan

Percent Exceedence	Corresponding Flow (cfs)
10	3,571
20	4,787
30	6,003
40	7,314
50	8,763

Terrapin Creek Flow

Duration Month = Jan

Percent Exceedence	Corresponding Flow (cfs)
10	149
20	189
30	246
40	299
50	355

EXAMPLE SCENARIO:

Mayo's Bar Real Time Flow on January 15 = 7,290 cfs.
This corresponds to 40% on the Mayo's Bar flow duration curve for January

To prevent disruptive flows downstream of Terrapin Creek the Terrapin Creek flow duration data for the 20% is selected = 189 cfs

189 cfs is released at Weiss spillway to (T1 to Terrapin Creek) & flows downstream of Terrapin Creek are 189 + Ter.Cr. flow.

This method creates inter- and intra- annual variations in minimum flows, mimicking a natural cycle. Dividing the real-time Terrapin Creek flow by two ensures that the conditions below Terrapin Creek are not drastically altered which could adversely affect existing mussel and fish populations. APC provided flow records to demonstrate how this proposal would be employed.

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The work group members discussed how this approach might be implemented in real time. Members accepted the concept although there was some general disagreement in the magnitude of flows spilled into the Weiss Bypass.

The work group discussed the following items:

- Development of a discharge rating curve that would accurately correlate the trash gate setting with discharge (flow) through the trash gate. Several members expressed a concern over the accuracy of such settings and measurements. APC assured members that the gate settings and resulting cfs measurements were as accurate as possible. Any future changes to project facilities would warrant recalibration of these settings and measurements.
- Minimum flows through the trash gates could be set in a “Monday morning” calculation, which averaged a set number of days. This would be preferable to an instantaneous flow measurement and minimum flow setting.
- Compliance could be measured through a “trash gate setting log”.
- In prolonged drought conditions would it be possible to create a flushing flow to assist aquatic resources? Does the “real time” approach include such flexibility?

Work group members agreed on the concept and will meet to refine and discuss other alternatives in upcoming meetings.

Conclusion

The next meeting of the E10 IAG Weiss Bypass Work Group will be held on August 29, 2002 in Montgomery, Alabama. APC will distribute all meeting materials via email in advance of the next meeting.

IAG documents and materials are posted on the Internet at www.southerncompany.com/alpower/hydro.

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Warrior and Coosa Relicensing Projects Combined

Weiss Bypass Work Group

Attendees

Dan Catchings – ADCNR

Stan Cook – ADCNR

John Hornsby – ADCNR

Ashley McVicar – APC

Jason Moak – Kleinschmidt

Malcolm Pierson – APC

Bill Sim – APC

Jim Crew – APC

Jeff Garner – ADCNR

J. Chris Greene – ADCNR

Henry Mealing – Kleinschmidt

John Peconom – Kleinschmidt

Andy Sheppard – APC

Action Items

- Prepare and distribute Weiss Bypass work group meeting notes.
Jim Crew & John Peconom Due – September 6, 2002
- Add Jeff Garner – ADCNR to all E10 IAG and Work Group email lists.
Jim Crew Due – September 6, 2002
- Follow-up with Stan Cook on email attachment problems.
Jim Crew Due – September 6, 2002
- Schedule an E10 IAG meeting to discuss the Smith Project.
Jim Crew Due – September 6, 2002
- Contact Carl Couret of the USFWS for his input on these discussions.
Jim Crew Due – September 11, 2002
- Describe existing conditions and identify available data for the Smith project.
Jim Crew, Bill Sim & Stan Cook Due – September 17, 2002
- Check on the Birmingham Water Board's dredging permit at Smith.
Stan Cook & John Hornsby Due – September 17, 2002
- Contact Patrick O'Neil regarding his involvement in this work group.
Jim Crew Due – September 17, 2002
- Present findings of the Smith project water quality report to the work group.
Jim Crew, Bill Sim & Stan Cook Due – November 6, 2002

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- Investigate fish hatchery operations in other states and the possibility of trading ADCNR raised fish for trout.
Jim Crew, Stan Cook & Henry Mealing Due – November 6, 2002
- Obtain a copy of the 1993 Creel Survey from ADECA.
Stan Cook & Bill Sim Due – November 6, 2002
- Contact John Eisenbarth about any angler use information he may have.
Henry Mealing Due – November 6, 2002
- Review and comment on Fish and Mussel habitat/reproduction information spreadsheets.
All IAG Members Due – November 6, 2002
- Contact Paul Johnson about questionable presence of mussel species in Weiss bypass.
Jeff Garner & Malcolm Pierson Due – November 6, 2002
- Peer review of the HEC-RAS model by Bob Allen and Dow Johnston.
Ashley McVicar Due – November 6, 2002
- Collect information on the Tilton and Little River flow gauges.
Ashley McVicar & Bill Sim Due – November 6, 2002

Agreements & Resolutions

- 1) Before beginning additional analyses of Smith project operations and associated aquatic resources, the issue should be raised in the larger E10 IAG so all issues can be brought to the table and all interested stakeholders can participate.
- 2) Additional information needs to be gathered on southeast fish hatchery operations to determine if there any opportunities to trade ADCNR fish for trout.
- 3) Patrick O'Neil was selected as the "expert" to help provide review of the Weiss Working Group.
- 4) The revised Fish and Mussel Spreadsheets should help future decisions concerning specific species in the bypass.
- 5) A peer review of the HEC-RAS steady-state model is needed, with particular attention on the Manning Coefficients.
- 6) The un-steady state model will provide more information in regards to flow regimes and available habitats associated with typical hydro operations.

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Meeting Notes

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Lewis Smith Project

The Weiss Bypass Working Group agreed to begin the meeting by having a preliminary discussion of the Smith tailrace issues. The meeting attendees thought that this “kick-off” discussion would give direction for subsequent E10 IAG meetings on Smith tailrace. Issues discussed included:

- advantages and disadvantages of changing the existing cold water fishery to a warm water fishery;
- flow and water quality below the dam;
- impacts of the Birmingham Water Board’s dredging practices in the Smith tailwater;
- potential to manage resources to benefit T&E species;
- management of the tailwater trout fishery;
- recreation use in the area; and
- how to proceed with these issues in the current relicensing process.

Issues Raised by the Department of Conservation and Natural Resources

Stan shared several questions that the ADCNR has concerning the Smith project as well as concerns from the public. These include:

- Why is there a cold water fishery downstream of Smith Dam and not a typical warm water fishery?
- Could this fishery be converted back into a warm water fishery by changing the release level?
- Do we need to convert back to a warm water fishery?
- Why should we keep this a cold water fishery?
- What are the benefits of a cold water fishery?
- What is the recreational value of a trout fishery and can it be improved?
- Are there opportunities to improve T&E species habitats?
- How do striped bass utilize the tailwater area?
- Are there any Dissolved Oxygen (DO) issues in the tailwater associated with project operations?
- Is there any way to mimic a natural flow regime in the tailwater?
- How is water distributed below the dam?

Birmingham Water Board

Henry reminded the group that the Birmingham Water Board periodically dredges below the Smith dam to maintain a channel for water withdrawal purposes. This periodic dredging is likely

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to create negative impacts through alteration of channel substrates and habitats and through increased erosion resulting from spoil materials and undercutting the bank. John Hornsby agreed to look into the Water Board's dredging permits and report back to the work group.

Project Operations

When the project is not operating (there is very little operation in the fall due to scheduled maintenance) the channel below the dam remains wetted. However, the amount of flow is uncertain. There is some leakage into the channel, but the exact amount is unknown. Full project operations can increase the water level by approximately 10 feet in some locations.

Dissolved Oxygen

Bill Sim is preparing the water quality report for the Smith Project that will include information about DO. Preliminary review of the data indicates that the DO below Smith is pretty good with only brief periods in January where the DO falls below 4 mg/l.

Switching to a Warm Water Fishery

APC highlighted a few of the major operational challenges they would face if the releases from Smith Dam were converted from cold water to warm water:

- Re-engineering of the project intakes – several million dollars.
- Negative operational effects on the downstream Gorgas Steam Plant. APC would have to construct cooling towers at a cost of \$80-100 million.

Since these changes are difficult and expensive, APC would prefer to work with stakeholders to maintain and improve the existing cold water fishery.

Fish Stocking and Hatcheries

Cold water releases from the Smith Project provide the opportunity for ADCNR to stock trout in the tailrace thus maintaining a "put-and-take" trout fishery. Trout are supplied in a "striped bass for trout" trade agreement between the USFWS and ADCNR. Due to the uncertainty of federal fish hatchery funding, the future of this relationship is in doubt and ADCNR is concerned that their source of trout may be eliminated.

The possibility of trading fish with other states was raised, but ADCNR was not sure if their hatcheries produce any fish that other states may want. However, if the opportunity to trade fish presented itself, ADCNR would be willing to consider trade agreements. There was a general consensus that more information needed to be gathered before exploring this issue further.

T&E Species

Mussel populations upstream of the Smith Project (upstream of Lewis Smith Lake) are some of the healthiest populations in the State. Cold water releases below the dam do not support mussel

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populations and there are no plans at this time to reintroduce mussel species. ADCNR expressed interest in exploring the possibility of reintroducing mussels and improving management for other non-game species.

Recreation

There is a question as to how much recreation information exists for the Smith tailrace fishery. Bill cited the 1993 Creel Survey conducted by ADECA and APC as part of the “water-wars” process. Malcolm stated that APC has fish collection data for the tailrace area and Ed Tybergine’s trout tracking study. Ancillary information may be available from John Eisenbarth. The group agreed to locate existing information as a basis for the decision-making process.

Relicensing Process

In this relicensing process, Issue Action Groups (IAG) established operating procedures that govern how IAGs and any subsequent working groups are formed. Meeting attendees discussed raising the Smith tailrace issues to the E10 IAG prior to officially creating a work group for the Smith tailrace. This will allow interested stakeholders to voice their concerns and participate in the process. The Smith tailrace issue will be discussed at the September 17, 2002 E10 IAG meeting.

Weiss Bypass Issues

Weiss Bypass Fish and Mussel Habitat/Life Preference Spreadsheets

John Peconom presented a **revised** fish habitat/spawning and a **draft** mussel habitat/reproductive information spreadsheet. As requested at our July 2002 meeting, each spreadsheet contained a compilation of existing information on fish and mussel species present in the Weiss Bypass. Work group participants discussed the information and agreed to review the data and provide additional information.

Stan asked if APC had contacted any of the “riverine experts” identified at the July 2002 meeting. Malcolm has contacted Pat O’Neil, and he is interested in participating. Jim Crew will follow up with Pat and address any of his questions. The group agreed with the choice of experts and look forward to his input. One of the first items for Pat to review will be the two spreadsheets.

HEC-RAS Model

Ashley McVicar presented a preliminary report of results from the calibrated steady-state HEC-RAS model. The calibrated model compares well with field data collected above Terrapin Creek but has a few discrepancies with field data collected below Terrapin Creek. After discussing several aspects of the model, the group agreed that the model should undergo a peer review and that the Manning Coefficients should be reviewed in greater detail to identify and eliminate

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possible errors in the model. Ashley will ask Bob Allen (ACOE) and Dow Johnston (ADECA) to review the model. The group agreed that Bob and Dow would conduct a peer review.

Seasonal Flows

At the July 2002 group meeting, Bill Sim proposed a draft seasonal flows concept as a potential method to mimic natural inter- and intra- annual flow regimes in the Weiss Bypass. After reviewing the draft seasonal flows concept, meeting participants provided feedback on how to improve this proposal. Discussion included the use of Terrapin Creek and Mayo's Bar as the flow benchmark/trigger, and the overall goal of the seasonal flows concept.

Terrapin Creek

Using the success of habitats and species below Terrapin Creek as a guide, the draft seasonal flows concept attempts to mimic these flows and habitats upstream of Terrapin Creek without adversely affecting habitats and existing mussel populations below Terrapin. However, some members indicated that discussions should not be limited by the premise that increasing flows by more than 100% downstream of Terrapin Creek would negatively impact existing mussel populations. Meeting participants agreed to discuss this in more detail at a future meeting.

Flow Benchmark

The draft concept uses the Mayo's Bar gauge as a flow benchmark. Meeting participants discussed whether the Mayo's Bar gauge was a suitable benchmark for determining flows. The gauge may not be reflective of a natural flow regime because flows reaching the gauge are regulated by upstream reservoir operations.

Participants agreed to look at the unregulated Tilton and Little River flow gauges to determine if they might be better suited as a flow benchmark for setting seasonal flows.

Flow Changes

In summary, this work group is attempting to determine the effects of flow releases on habitat and then assess the effects of those habitat changes on aquatic species within the bypass.

Conclusion

The next meeting of the E10 IAG Weiss Bypass Work Group will be as soon as the unsteady state HEC-RAS model has been calibrated. APC will distribute all meeting materials via email in advance of the next meeting. On September 17, 2002, APC will update the E10 IAG on the Work Group discussions to date.

IAG documents and materials are posted on the Internet at www.southerncompany.com/alpower/hydro.

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Meeting Summary: APC Headquarters – Birmingham, AL – November 14, 2002

Final 02-19-03

Warrior and Coosa Relicensing Projects Combined

Weiss Bypass Work Group Members

Dan Catchings	ADCNR	Stan Cook	ADCNR
Carl Couret	USFWS	Jim Crew	APC
Henry Mealing	Kleinschmidt	Malcolm Pierson	APC
Andy Sheppard	APC	Jeff Garner	ADCNR
Bill Sim	APC		

Other Attendees

Mike Akridge	APC	Rick Allums	APC
Elrand Denson	USFS	Bill Dykes	APC
John Eisenbarth	TU	John Eisenbarth II	
Joel Gardner	USFS	Jim Hancock	Balch & Bingham
Daryl Harley	USFS	Patric Harper	USFWS
Jon Hornsby	ADCNR	Yahia Majali	Malcolm Pirnie
Pam McDaniel	APC	Jim McHugh	ADCNR
Diana McLemore	ADECA OWR	Dan Murchison	Lake Mitchell HOB
Bill O'Brien	WLIA	Abner Patton	Malcolm Pirnie
John Peconom	Kleinschmidt	Alan Peeples	APC
Jason Redmond	APC	Kelly Schaeffer	Kleinschmidt
Bill Sim	APC	Ralph Thompson	USFWS
Danny Tignor	APC	Isabella Trussell	LMLPA

Action Items

- Finalize and post August 29, 2002 Working Group meeting notes summary to APC's hydro relicensing website.
Jim Crew Due – November 29, 2002
- Draft and distribute November 14, 2002 Working Group meeting notes summary.
Jim Crew Due – December 6, 2002
- Review Weiss Bypass Unsteady-state model results, Fish and Mussel habitat/life preference spreadsheets, and select a few potential flow scenarios for the group to examine.
All Work Group Members Due – December 09, 2002
- Research temperature and dissolved oxygen information available for the Weiss Bypass.
Bill Sim Due – December 09, 2002

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Agreements & Resolutions

- 1) The Mayo Bar gage will serve as the trigger/benchmark for Weiss Bypass seasonal flows. An advantage of using this gauge as a trigger/benchmark is that it avoids natural extremes. Developments in the “water-wars” will need to be monitored closely in case there are significant changes to flows at Mayo Bar.
- 2) The unsteady-state model is calibrated and should provide the Work Group with a tool to examine various flows in the Weiss Bypass.

Meeting Notes

These notes summarize the major items discussed during the meeting and are not intended to be a verbatim transcript or analysis of the meeting.

Weiss Bypass HEC-RAS Model

Bill Dykes provided copies of the Weiss Bypass Study Unsteady-State Report to group members. He reviewed the report and explained that there were essentially two HEC-RAS models that APC is using to model flows in the bypass: 1) the steady-state model which models bypass flows with no influence from generation at Weiss Dam and 2) the unsteady-state model which models both bypass flow and generation influence. The unsteady-state model is much more representative of actual conditions because it is able to depict dynamic conditions with multiple inputs.

Both models were calibrated using information collected by the USGS and APC during three observed test flows of 50, 540 and 809-cfs at 33 transects located throughout the bypass reach. Bill also noted that results from both models were very similar to observed and expected field conditions.

HEC-RAS Steady-state

Based on concerns about Manning coefficients that were expressed at the last Weiss Bypass Working Group meeting in August, the steady-state HEC-RAS model was distributed for peer review by Dow Johnston (ADECA-OWR) and Bob Allen (ACOE). Input from these peer reviews enabled APC to modify the model and improve calibrations. Even with these inputs, the steady-state model did not calibrate completely in the lower transects.

HEC-RAS Unsteady-state

This model is an extension of steady-state model and effectively demonstrates dynamic flow conditions in the Weiss Bypass that account for a minimum flow release from the spillway, Terrapin Creek flows and the backwater flows associated with various hydroelectric generation. Bill demonstrated model output for “typical” operating scenarios during January, March, and June.

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January Operation utilized a 355 cfs flow from Terrapin Creek, a 220 cfs spillway release, with 11 hour (5 hr. in morning and 6 hr. in evening) 3 unit operation.

March Operation utilized a 551 cfs Terrapin Creek flow, a 328 cfs spillway release, with 14 hours (continuous) 3 unit operation.

June Operation utilized a 179 cfs Terrapin Creek flow, a 122 cfs spillway release, with 5 hours (continuous) 3 unit operation.

Spillway release flows were based on APC's flow recommendation (see Weiss Bypass Working Group Minutes – July 16, 2002) to use the Mayo's Bar gage as a guide for flow variation in conjunction with the Terrapin Creek flow duration curve up to the 50th percentile flow.

The unsteady-state model output includes:

- flow velocities;
- flow direction;
- water surface elevations;
- depth; and
- timing and duration of these characteristics.

Next Steps

The Work Group will use the model output for various flow and operation scenarios in conjunction with the range of aquatic species preferences to identify flow changes that would improve aquatic habitat in the Weiss Bypass. To accomplish this, the Work Group agreed to review the Weiss Bypass Study Unsteady-State Report as well as the Fish and Mussel habitat/life preference spreadsheets that the Work Group had developed and begin to identify a range of flows that might be the most beneficial to meet management goals in the bypass.

It was noted that the model generates large volumes of data and requires significant resources to successfully process this data. As such, the IAG members should attempt to narrow the number of model run requests as much as possible. At the next Work Group meeting, members will propose and discuss potential modeling scenarios.

Bill Sim was also asked to find out the amount and type of water quality data that is available for the bypass during generation backflows. The Work Group would like to review this data to determine if additional information will be needed during 2003.

Conclusion

The next meeting of the E10 IAG Weiss Bypass Work Group will be scheduled in January/February 2003 by Jim Crew after consulting with Work Group members. APC will distribute all meeting materials via email in advance of the next meeting.

IAG documents and materials are posted on the Internet at www.southerncompany.com/alpower/hydro.