FISH & WILDLIFE ISSUE SHEET

MARTIN ISSUE GROUP ONE (MIG 1)

Determine the overall health and abundance of fish and wildlife habitat and populations on Lake Martin and examine the effect(s) the Project has on fish and wildlife species.

DESCRIPTION OF ISSUE

Stakeholders expressed concerns regarding the Project's potential impact on fish and wildlife at Lake Martin, such as habitat availability, project land use planning, operations, and recreation.

Specific issues or areas of potential effect include:

Fish Habitat

- Effect of continuing the fish habitat program
- Project impact on migratory fish (e.g., American eel, mooneye, paddlefish)
- The effects of deep (cold) water discharge on native fish populations in the Tallapoosa River
- The lack of adequate water quality for fish species such as striped bass, especially during the summer in Lake Martin
- Habitat alteration/fragmentation of the Tallapoosa River due to the Martin Project
- Account for striped bass mortality and/or fish distributions that could be associated with a rule curve change, limited thermal refuges, dissolved oxygen (DO) and current operations
- Inadequate nutrient levels in Lake Martin and the effect on larval/juvenile fish growth
- Why is the crappie fishery declining? Can it be improved?
- What is the effect of the commercial fishery on the Lake?
- Effect on formerly connected stream systems interrupted by impoundment and dam on native fishes and mollusks

Threatened and Endangered Species

- Restore long leaf pine habitat
- Determine presence and abundance of Threatened and Endangered Species (Bald eagle nesting sites, Red Cockaded woodpecker, mussels, snails)

Project Lands

- Are additional lands needed for wildlife?
- Retain natural undeveloped area and manage for wildlife
- Do the islands provide unique habitats that need protection? Protect islands from erosion and destruction
- Control the type of bulkheads and make more "fish friendly"

Project Operations

- Lake level fluctuation impacts on fish production
- Effect on the fishery population from entrainment/impingement from project operations
- Are project operations causing the number of amphibians to decline in lake (especially frogs)?
- What are the effects of a new winter drawdown on grassy vegetation establishment along the shoreline and aquatic plants in general?
- Determine effect(s) of rule curve change and current operations on striped bass
- Shoreline seeding - is it legal and does it provide a benefit?
- Littoral and stream habitat effects in reservoir drawdown zone from Project operation
- Effects of potential changes in project operation on hydrology (e.g., water storage and generation patterns [monthly/seasonal time steps]) on native fishes and mollusks
- Effects of Project operation on sediment delivery to Tallapoosa River below Martin dam and associated impacts to native fish and mollusk habitats
- Effects of Project operation on water temperature, dissolved oxygen, total dissolved gases, and associated effects to native fish and mollusks
- Determine need for continuous minimum flow below Martin; understand how releases from Martin affect Yates reservoir

Recreation and Land Use

- What is the impact to the quality of the fishery resources from fishing tournaments? Are there too many tournaments?
- There should be a requirement to place rip rap at the base of sea walls
- The balance between property improvements and impacts to fishery habitat

ADDITIONAL ISSUES IDENTIFIED FROM PAD QUESTIONNAIRE

- No additional issues identified

GEOGRAPHIC SCOPE

- APC-owned lands within the Project Boundary, but include areas of tributaries where habitat for species of concern is present

EXISTING INFORMATION

- Rare, threatened & endangered species: Inventory reports with county-level information.
- Alabama Department of Conservation & Natural Resources, Wildlife and Freshwater Fisheries Division, Fisheries Section - Martin Reservoir Reports for the following years: 1988, 1989, 1991, 1992, 1995, 1998,200001,2003-04, and 2005.
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- John Phillip Hawke. 1974. Factors contributing to bacterial fish kills in large impoundments. Master's Thesis, Auburn University, Dept. of Fisheries and Allied Aquacultures.
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- R. Jason Dickey. 2006. Oligotrophication effects following diversion of waste effluent from an embayment of Lake Martin, Alabama. Master's Thesis, Auburn University, Dept. of Fisheries and Allied Aquacultures.
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CURRENT ANALYSIS/STUDY

- APC is preparing a white paper regarding Water Quality and Summer Die-off of Striped Bass on Lake Martin
- Historic and current water quality data report presented in the PID
- Threatened and endangered species surveys for aquatic and terrestrial species (Red cockaded woodpeckers, snails, and mussels)
- APC is collecting LIDAR (Light Detection and Ranging) data that can be used to identify littoral zones and determine seasonal or annual wetted habitat changes with a proposed change in the rule curve and determine impacts to fishery and invasive aquatic plant species
- Report of Auburn studies on tournament effects on fish structure within Martin Reservoir in the PAD

ADDITIONAL STUDY/INFO

- Evaluate effects of rule curve alternatives
- Desktop entrainment/mortality study
- Striped Bass Tagging/Hydroacoustic study
- Literature analysis of diadromous species distributions – emphasis on historic patterns of migratory fish especially American eel in the Tallapoosa River and associated recovery plans
- Rare, Threatened, and Endangered species surveys of Lake Martin and tributaries – Research of historic species distributions – possible identification of dam removal projects
- Develop a Wildlife Management Plan for the Martin Project – inclusion of RCW's
- Develop a study plan to determine species type and abundance of fish adjacent to a variety of shoreline stabilization types – including natural habitat
- Develop a survey of the existing aquatic resources of the Martin tailrace (fish & unionids) – document water level changes that occur on Yates as a result of Martin releases and the Thurlow minimum flow – document mechanical/operational limitations at the Martin Dam

WATER QUALITY & QUANITY ISSUE SHEET
MARTIN ISSUE GROUP TWO (MIG2)

Determine the effect of future operation on water quality and water quantity in Lake Martin.

DESCRIPTION OF ISSUE
Stakeholders expressed concerns regarding potential sources of effects on water quality within Lake Martin, such as erosion, water withdrawal, wastewater discharges, development, and recreation.

Specific issues or areas of potential effect include:

Erosion
- Evaluate/investigate siltation issues in Red Creek and Blue Creek due to timber industry
- Effects of development on siltation and erosion; shoreline protection of vegetation; need for buffer zones

Operations
- Can APC improve the declining water quality in the lake?
- Need to have a hydrodynamic model for Lake Martin to understand flow and water quality in lake (3-D model)
- Need to have [water quality] monitoring in the embayments
- How will lake level fluctuations impact water quality and/or erosion?
- Increase dissolved oxygen (DO) in project discharge from 4 to 5 mg/l
- Investigate methods to reduce trash/debris on bottom of lake; extend window of opportunity for collection days
- The lake bed is eroding due to lake level fluctuations on a seasonal basis (plant rye grass)

Municipal/Industrial Discharges/Waste Water Treatment Facilities
- Calpine power plant impacts to Hillabee Creek
- NPDES permits from Alexander City and impact to Wind Creek and Lake Martin water quality
- Effects of Coley Waste Water treatment plant on Lake Martin water quality
- Reduce the amount of permitted and illegal pollution/sewage coming into the lake (point and non-point) sources
- Considering the overflows at Dadeville treatment facility, what are the impacts to Sandy Creek?
- What are the effects of sewage outflows into the reservoir?

Development

- There are changes occurring in the water quality in Sandy Creek, Blue Creek, Upper area which are currently undeveloped - keep undeveloped to protect water quality
- APC should look at control of surface runoff through use of holding areas - water quality, sedimentation, etc. at developments (condos and homes)
- Effects of Best Management Practices (BMP) on the water quality of Lake Martin with regard to development
- New development, re-inspection of systems and impacts to water quality
- Control nutrient loading; address the effects of invasive/exotic species on the Lake
- What is being withdrawn in terms of water and how does it correlate to population?
- Limit future permitted water withdrawals, especially municipalities and new withdrawals
- Accommodate/increase existing permitted withdrawals for riparian use

Recreation

- Impacts of storm water run off, houseboats, and marinas on the water quality of Lake Martin
- Regulate the disposal of holding tanks on boats - require pumping station per "X" number of slips
- Evaluate shoreline erosion and water quality impacts from increased boat traffic
- Evaluate impacts to recreation in Sandy Creek as a result of water quality
- APC should provide greater commitment to increase buffer zone around Lake Martin to improve water quality
- Impacts of unregulated primitive camping/debris/erosion on wildlife and vegetation

ADDITIONAL ISSUES IDENTIFIED FROM PAD QUESTIONNAIRE

- An assessment of the near-term and potential long-term effects of the Alexander City waste water treatment plant effluent on public health and aquatic biota
- An assessment of all other NPDES permitted wastewater treatment plants that discharge into Lake Martin
- An assessment of the contribution of failing septic tanks of shoreline residences to higher increased incidents
- Technical assessment of the feasibility of attaining Outstanding Alabama Water use classification for Lake Martin
- An assessment of the potential effects of a reduction of winter drawdown

pool level on nuisance periphyte and macrophyte productivity in shoreline areas, especially in shallower slough areas

GEOGRAPHIC SCOPE

- APC-owned lands within the Project Boundary and specific tributaries as they pertain to water withdrawal, water treatment plant influx, and upstream siltation events that flow into, or otherwise affect, Lake Martin

EXISTING INFORMATION

- Water Resources: Consumptive Water Use Data; HEC-5 model for ACT Basin; HEC-5Q water quality model for ACT Basin; Water Quality Inventory for ACT Basin (cutoff at about 1994).
- Lake water quality data: Alabama Water Watch citizen-based water quality monitoring data. (13-year record of monthly physical and chemistry measurements by Lake Watch of Lake Martin volunteer monitors for selected sites around the lake).
- Deutsch, W. G., Feb 2000. Citizen Volunteer Water Quality Monitoring of Alabama Reservoirs, Lake Martin Report, Alabama Water Watch. (Summary report of Lake Martin citizen-based water quality monitoring and data trends for 1993-99).
- Deutsch, W. G. et. al., Feb 2005. Tallapoosa Watershed Project – A Transferable Model of Stakeholder Partnerships for Addressing Nutrient Dynamics in Southeastern Watersheds, 2004 Annual Report. (research findings for lake and selected watershed stream sampling during 2004 incorporating data and analyses using standard methods, citizen water watch protocols, close-range hyperspectral measurements, and satellite remote sensing).
- Deutsch, W. G. et. al., May 2006. Tallapoosa Watershed Project - A Transferable Model of Stakeholder Partnerships for Addressing Nutrient Dynamics in Southeastern Watersheds, 2005 Annual Report. (research findings for lake and selected watershed stream sampling during 2004 incorporating data and analyses using standard methods, citizen water watch protocols, close-range hyperspectral measurements, satellite remote sensing and Soils and Water Assessment Tool (SWAT) modeling of nutrient loading from the Lake Martin watershed).
- Alabama Clean Water Partnership. March 2005. The Tallapoosa River Basin Management Plan. (Section 5 Middle Tallapoosa, cited references, and appended supporting data address the point and non-point water quality concerns regarding Lake Martin, its tributaries, and surrounding environs. This document also provides other information relevant to the resource topics listed in section 2a of this questionnaire).

CURRENT STUDY/ANALYSIS

- Prepare a complete list of all NPDES sources
- Water withdrawals white paper

ADDITIONAL INFO/STUDY

- Hot spot erosion study, possibly using the LIDAR data for the reservoir
- Investigate effects on water quality as a result of potential increased consumptive demands, increased wastewater loadings, and effect of rule curve changes; include Aquatic Vegetation Distribution Study
- Additional water quality monitoring of eutrophication in upper lake embayments most affected by nutrient enrichment
- Develop a Water Quality Adaptive Management Sampling Plan for gathering baseline and monitoring data for comparison of changes in Lake Martin water quality due to potential changes in rule curve

PROJECT OPERATIONS ISSUE SHEET
MARTIN ISSUE GROUP THREE (MIG3)

Determine the feasibility of changing the Martin rule curve and, if feasible, analyze the effects (both negative and positive) as a result of a potential rule curve change on all resource areas.

DESCRIPTION OF ISSUE

Stakeholders expressed strong desire to change the Martin rule curve and to determine the effects of changing the rule curve on various project resources such as fish and wildlife, general operations of the project, and navigation.

Specific issues or areas of potential effect include:

Lake Level Fluctuation

- Keep 10ft winter drawdown to accommodate flood and to help home owners to work on docks
- 5 ft draw down would reduce rate of siltation
- Impact of project operations and lake level changes on head cutting in the tributaries and sediment accumulation
- Remain at 489 ft msl elevation in winter; periodically drop to 481 ft msl
- Is there an option to retain 10ft drawdown on a periodic basis (every other year for 1 month)?
- Effects of raising the winter pool elevation even 5 ft would eliminate shoreline work - if seawalls aren't erected, increase in erosion due to boat wake
- Can APC do a trial of raising winter pool and evaluate all impacts to resources?
- Can APC raise lake to full pool by March 1 and maintain to December 1?
- Keep summer pool at 491 ft msl through October
- Examine the rule curve minimum
- Concern that APC is operating in the summer to make profit instead of keeping the lake up

Operations

- Impacts of flows at Martin on Lake Wedowee
- Use adaptive management in the new license and leave FERC out
- Investigate changing all Tallapoosa River license terms so they all expire at once
- All evaluations of changes in operation must consider Harris operations; all studies should document the interaction of Harris with Martin
- Evaluate Harris Reservoir to see if it can share storage (flood) with Lake Martin
- Harris, Martin and Yates and Thurlow need to be evaluated together; provide a basin review
- Look at the drought management plan
- How does the need for flood control affect winter pool levels?
- Assure flood control requirements are met during any change in the rule curve

Navigation

- Will APC ask the U. S. Army Corps of Engineers (USACE) to re-evaluate their navigation requirements? Review times when flooding is more probable

Fish & Wildlife

- Proceed cautiously with lake level change and examine effects for water quality, fish and plants
- Evaluate effects of project operation (timing of releases, magnitude, duration) on the different life-stages of aquatic resources
- Opportunity for adaptive management (in terms of operations)

ADDITIONAL ISSUES IDENTIFIED FROM PAD QUESTIONNAIRE

- Modification of the Martin project operational guide curve to achieve a 6 month full-pool season and 5 ft or 6 ft winter drawdown
- Water levels-winter drawdown level to 486 ft msl and full pool season extended from March 15 through October 31

GEOGRAPHIC SCOPE

- Project lands and lands potentially affected by rule curve changes

EXISTING INFORMATION

- Current Martin Project license guidelines (Exhibit H (revised))

CURRENT ANALYSIS/STUDY

- Using APC's flood flow and hydro budget models, evaluate and select rule curve alternatives from 481 ft msl to 491 ft msl

ADDITIONAL INFO/STUDY

- Need good baseline data for use in developing an adaptive management process/program for the Martin winter rule curve change. The following types of baseline information are needed:

    - Existing sediment levels and aquatic plant info
        - Look especially at Blue Creek, Sandy Creek, Irwin Shoals, Lower Hillabee Creek
        - Literature search on other lakes in the SE that could be used to help predict levels of eutrophication as result of rule curve change
    - Water quality measurements
        - ADEM is interested in current and long-term reservoir and downstream water quality data including chlorophyll *a* and nutrient levels

SHORELINE MANAGEMENT ISSUE SHEET
MARTIN ISSUE GROUP FOUR (MIG4)

Develop a Shoreline Management Plan that takes into account project land use planning and assesses the effectiveness of Lake Martin's shoreline permitting program.

DESCRIPTION OF ISSUE
Stakeholders expressed concerns regarding shoreline management planning, permitting, enforcement of shoreline activities, and a desire to permanently protect natural/undeveloped lands.

Specific issues or areas of potential effect include:

Land Protection
- APC should permanently protect lands, via conservation easements, in perpetuity not just through land classifications
- Use of BMPs in construction areas
- Physically protect islands from development for habitat/recreation use; restore and protect Sand Island/Smith Mountain area and lands from Irwin Shoals to Camp ASCCA
- APC should acquire additional lands for land/habitat protection

Development /Enforcement
- Over development of lake - condominiums, people, aesthetics
- Obligations to issue permits to commercial operations
- Provide consistency in requirements and guidelines for permitting (permit term)
- Restrictions are needed around the power lines near Still Waters
- Apply consistent enforcement of shoreline regulations
- There is an overall lack of zoning ordinances - process should include APC and counties
- Causeways and bridges to islands - are these permitted?
- How to control condominium development
- Increase penalties (in $) for constructing causeways and return them to their natural condition - Donut Island
- Public wants to see APC's plans for future development of APC-owned lands
- Shoreline Management Plan (SMP) should have Best Management Practices (BMP), strong education for developers, buffer zones and set backs
- Enforce shoreline management guidelines on septic systems (e.g., withhold electricity as punishment)

Land Transfers

- Develop a task force or study to look at voluntary contribution of lands on the west side
- Forbid land transfers of APC-owned lands that might change classification designation

Operations

- Cemeteries that exist under water (Coosa County)
- There should be an overall management plan to preserve/manage all resources within Project Boundary (land, water, and habitat)
- APC should assist communities in development of land management planning
- Need land use map for entire shoreline
- SMP should address erosion due to water level changes and effects on recreation and aquatic habitat
- Clarify how APC does or could manage lands above 491 ft msl and exert more management control over natural habitats

Recreation

- Keep undeveloped headwaters area that way with trails, non motorized access/activity
- Plan ahead to support growth (e.g., parks, overnight facilities, historical sites)
- Create permit system for camping on islands; charge a nominal fee

ADDITIONAL ISSUES IDENTIFIED FROM PID QUESTIONNAIRE

- No additional issues identified

GEOGRAPHIC SCOPE

- APC-owned lands within the Project Boundary

EXISTING INFORMATION

- No information provided

CURRENT ANALYIS/STUDY

- APC is updating land use maps
- Using LIDAR data, APC will verify the Project Boundary and present on the map

ADDITIONAL INFO/STUDY

- Develop a Shoreline Management Plan
- Evaluate effects on permitting/shoreline activities as result of proposed rule curve change

RECREATION ISSUE SHEET
MARTIN ISSUE GROUP FIVE (MIG5)

Determine the adequacy of present and future recreational facilities on Lake Martin.

DESCRIPTION OF ISSUE

Stakeholders expressed concerns regarding the need for additional recreational opportunities, access, and increased law enforcement/safety on Lake Martin.

Specific issues or areas of potential effect include:

Access

- Impacts of 4-wheelers in lake bed and on other property
- There is a need for more bank fishing
- Accessibility to Irwin Shoals area
- Avoid overcrowding on shoreline at mouth of Madwin, mouth of Manoy, on whole lake on all inlets

Navigation

- Mark a safe channel in the shallows of upper reservoir
- Hazard buoy markings become critical at these levels (elevation 486 ft - 484 ft msl)
- Hazards in the main body of the lake - some areas need to be marked or removed
- High density development in sloughs (houses and boat docks)
- Boat congestion and safety issues
- Mark hazards at 485 ft and 483 ft; remove hazards
- Need night time navigation aids on Lake Martin; need lighting on hazard buoys
- Need for additional parking at Kowaliga launch
- Need for additional public ramps and need for improving existing ramps - Blue Creek, Castaway ramps are both in bad shape

Enforcement

- Should be requirements to include lighting on boat docks for safety
- Enforce noise regulation for boats
- Need to have regulations for fires on project lands
- Evaluate how no wake zones are determined
- Consider property damage and siltation/erosion in addition to safety and look at all the high use areas
- APC should add more no-wake zones
- Limit mooring buoys especially around natural/undeveloped areas
- Speed limits on water - coves, no wake zones, etc.; boat traffic in sloughs

Operations

- Water patrols (Alabama Marine Police) should be involved in relicensing process
- Consider establishing a carrying capacity - look at boat lengths, boat numbers, boat horsepower, speed limits (Lake Lanier is bad)
- What is the carrying capacity of the lake? Identify capacity of the lake, and recreation development
- Measure the opportunity cost of lost recreation due to water level management - see study done in 1990s on this issue by Auburn University and funded by APC; update this study
- Area of Madwin Creek and DARE Park should be permanently undeveloped
- Effect on socioeconomics/economic from lake level drawdown proposals and existing operations
- Consider public recreation and commercial needs and get the economic value of recreation (boating and fishing) on the Lake to aid in making balanced decisions about water level management
- Keep future recreational lands as natural/undeveloped

Recreational Facilities

- Need for more formal and primitive camping and provide trash containers at boat ramps
- Add more "DARE" parks on the Kowaliga side
- Need for shoreline restoration around Scenic Overlook; also need repairing of picnic tables, and debris removal at Overlook
- Need for additional hiking trails around the Martin Project, especially in the upper reservoir
- Additional passive recreation areas are needed (walking, biking, etc.)
- Address ADA facilities/access
- Impacts of camping on islands in regards to littering, etc.
- Litter/debris removal issues at Sturdivant Creek Ramp and other areas

- At public use areas it would be nice to have trails (walking, biking), ecological signs/info, better accessibility by Smith Mountain and DARE Park

ADDITIONAL ISSUES IDENTIFIED FROM PAD QUESTIONNAIRE

- Existing APC sites need improvements to meet current accessibility standards; in particular courtesy docks gangways are often not barrier free. The SOBA design manual is very helpful for these issues
- Boat ramps are on the APC maps but little is known about bank fishing sites
- We need a comprehensive survey of current boating and bank fishing sites and potential sites that are on project land and potential land that may be considered for public access
- Conduct a recreational assessment
- Add set-asides for public use
- There is a need for more public access, in particular, boating access to reduce the congestion at existing sites and to "spread" fishing tournaments over a wider area as most seem to be in the Wind Creek area. Boat ramps are needed in the Kowaliga Creek arm both south of the bridge and the northern end of this arm of Martin. Also a need for a boat ramp exists at the very upper part of the reservoir such as Irwin Shoals/Jay Bird Creek area

GEOGRAPHIC SCOPE

- APC-owned lands within the Project Boundary

EXISTING INFORMATION

- Land use/ownership map identifies ownership of the islands and areas for potential trail and parking development
- Inventory and projection information developed in Comp Study, including Lake Martin
- The States Organization for Boating Access (SOBA) has a lot of information regarding boating and angling access including accessibility design along with information regarding pump out programs, etc. SOBA has just released a revised edition of: Design Handbook for Recreational Boating and Fishing Facilities, Second Edition

CURRENT ANALYSIS/STUDY

- APC is conducting a recreation facility inventory
- APC is conducting a Boat Density Study, beginning in May 2007
- APC is conducting a Recreation Use Study, includes traffic counters in shoulder seasons
- APC will use the recreation use study data to determine future use estimates

ADDITIONAL INFO/STUDY

- Develop a Martin Recreation Plan
- Evaluate effects on recreational facility use on as result of rule curve changes