TEXAS PARKS & WILDLIFE

OFFICE MEMORANDUM

COORDINATION-ROUTING			
ORG.	NAME	INITIAL	DATE
REMARKS:			
RETURN TO:			

TO: Nathan Garner, Director
Wildlife Region III

FROM: John C. Jones
Area Manager, CSIV

SUBJECT: Sulphur River Management Strategy

RE: COE/FNI Proposal

DATE: July 30, 2002

Nathan,

As per your instruction, I have discussed the Sulphur River management strategies as proposed by the COE and FNI with Carl Frentress, Kevin Kraai, Corey Mason and Perry Richardson. The information we present to you is a collaborative effort. It is our best guess of how this plan to increase the yield from the Sulphur River watershed would affect the Cooper and White Oak Creek WMAs. I will try to summarize our discussions and will attach some additional background information presented in more detail. I have also included a management scenario of the two-lake system for one annual cycle while working under ideal conditions with no limiting factors.

We all agree that the strategy proposed (as we know it) is a workable plan and much more acceptable than the alternative. It was necessary to make some assumptions based on the absence of what we considered to be pertinent factors:

- What will be the target increase in volume for each reservoir?
- What will be the duration of the water storage (hydroperiod)?
- What will be the dates of the increase (seasonality)?
- At what rate will the exchange take place?
- What acreage will be impacted?

Many of these questions will be answered only when the strategy is put into action but the answers may effect the results.

The White Oak Creek Wildlife Management Area is located up river from Patman Lake with an elevation difference of some 12 feet between the lowest control structure in the wetlands (242) and the proposed maximum conservation storage level (229). Because of this difference, we believe the proposed level changes in Patman lake operations should have minimal effect to this WMA. Also, the normal flood events that will occur are not expected to have greater impacts to the WMA when/if the operational level of Patman Lake is increased by the proposed amounts. Furthermore, if there is an increase in the in-stream volumes at White Oak Creek, we expect a

beneficial result. This will enhance aquatic resources and, consequently, terrestrial fauna that utilizes them.

The conditions at Cooper WMA are decidedly different. Because the WMA is located on the shore of the lake where the level changes will occur, we suspect that it will be directly affected. The impacts will be greatest if the extra water is held for significant durations. If, however, the surplus water is pumped away in a timely fashion and not allowed to accumulate, subsequent impacts would be minimized.

Management Strategies

In general, we should continue to initiate and utilize strategies at our WMAs that maximize wetland functions and values. We can adopt a more flexible approach and therefore adapt our strategies to the conditions presented by the resource.

If water level fluctuations are reasonably predictable and/or controllable, we should continue to utilize moist-soil techniques.

- Drawdowns or de-watering to occur in spring to benefit migrating shorebirds
- Expose mud flats
- Capture seed production
- Promote annual plant growth for waterfowl food production
- Drawdowns in late summer to benefit fall migrating birds

If water levels trend toward higher elevations for longer durations, adopt strategies more consistent with permanent emergent marshes.

- Maintain water levels for increased wading bird usage
- Convert to more permanent marsh vegetation
- More controls for noxious vegetation
- Provide habitats for brooding and molting of waterfowl
- Provide waterfowl food

In reality, a combination of these techniques will most likely prevail.

Cooper Wildlife Management Area

Positive Effects

We believe that if pumping schedules permit, withdrawal of water from the Chapman Reservoir can be beneficial in:

- Encouraging extensive stands of annual plant species that produce foods for ducks. The potential exists for substantial acreage to be affected positively.
- Most desirable drawdown periods are early season (late January-early March)
- Mid-season (mid March – early May) drawdowns can produce excellent results when pest plants can be suppressed
- Mid-season drawdown would greatly benefit the Least Tern populations known to utilize the WMA for breeding and nesting activities.
- Rapid late summer drawdowns (August - mid-September) conducted in several increments produce mudflats that are used heavily by migrating shorebirds.

- Exposed mud flats provide excellent foraging areas for shorebirds before vegetative cover is too thick.

Negative Effects

If pumping schedules were not coordinated with wildlife management goals, we would lose our ability to perform the needed drawdowns. This would cause several negative events to occur:

- Increase the potential for encroachment of undesirable plants species.
- Increase our costs through advanced weed control efforts
- Longer hydroperiods would create an added expense burden through increased levee maintenance requirements.

Unacceptable Effects

- Excessively high water levels during the growing season (permanent flooding)
- Absence of some seasonal flooding
- Any additional storage above the conservation pool that directly floods bottomland hardwood forests during the growing season or has a negative impact to water table (Need to know how water table changes as a result of additional water storage in streams. A permanent rise in the local water table would damage trees.)
- Any actions resulting in damages to existing infrastructure is the responsibility of the COE. Our contract is to manage these Areas based on the existing lake management strategies.
- Any operational change that detracts from gains made in the habitats and infrastructure thus far.

White Oak Creek Wildlife Management Area

Positive Effects

- In-stream water levels will slightly increase
- Enhance aquatic resources and consequently benefit terrestrial fauna that use them

Negative Effects

- Impacts to water table unknown
- Damage to bottomland forests if water table permanently increases
- If the water level in the Sulphur River were increased to the extent that levels reach operational levels at the WMA wetland system, we would lose our ability to draw down water in our moist-soil units (primarily late winter to early spring).
- Significant increases in water levels for long durations would effect the integrity of our wetland infrastructure and add maintenance burden on the Department.

Unacceptable Effects

- Excessively high water levels during the growing season (permanent flooding)
- Absence of some seasonal flooding
- Any additional storage above the conservation pool that directly floods bottomland hardwood forests during the growing season or has a negative impact to water table (Need to know how

water table changes as a result of additional water storage in streams. A permanent rise in the local water table would damage trees.)

- Any actions resulting in damages to existing infrastructure is the responsibility of the COE. Our contract is to manage these Areas based on the existing lake management strategies.
- Any operational change that detracts from gains made in the habitats and infrastructure thus far.

Conclusion

As Carl writes, "the difficulty of developing management recommendations with a modest amount of information is prodigious. For this reason, we qualify our material with recognition that improvements and adjustments can be made in a continued spirit of optimizing fish and wildlife benefits as more specific useful information becomes available." However, we believe that we can manage these two WMAs without significant negative impacts while working in the strategy framework as presented to us. Open minds and dynamic management plans should prevail.

A Hypothetical Annual Management Plan for the Chapman - Patman Reservoir System

Jan. 1 – Chapman is at 440 feet elevation and Patman is at 228 feet. In mid-late January begin a slow draw down until late **April**. This could be accomplished by either pumping water to Lake Lavon (upstream) or by releasing water to flow through the system. Draw down continues until an elevation of 436 is reached.

This would yield: 1) annual plants for duck food production 2) expose mud flats for utilization by spring migrating shorebirds 3) provide breeding and nesting habitats for the Least Tern populations known to occur at the Cooper WMA.

Maintain the 436 elevation until **July**. At that time begin a moderate increase in water depths at Chapman with water from Patman to reach a maximum of 438 feet. The removal of water from Patman will expose mud flats that will be seeded, by air, with Japanese Millet to 1) prevent invasion of noxious plants and 2) provide a food source for wintering waterfowl.

Mid – late August – Chapman will initiate the first of two drawdowns (pumping or release). Each will be of about one foot in drop. The second will occur during **September** and concluded by **October 1** for a total water level change of 2 feet and thus back to the 436 elevation. This will provide habitat for fall migrating shore birds.

Thereafter, both reservoirs can re-fill to original elevations (Chapman – 440 and Patman – 228) and maintain that level until **January**.

DRAFT

Wright Patman/Cooper Reservoirs Water Exchange Project

Introduction:

Below are recommendations concerned with optimizing fish and wildlife benefits from a proposed water exchange process between Wright Patman and Cooper Reservoirs. Sites of concern include: Wright Patman Reservoir, Cooper Reservoir, White Oak Creek, Sulphur River, White Oak Creek Wildlife Management Area, and Cooper Lake Wildlife Management Area.

When initially contacted, we understood that: 1) substantial dynamics would occur in water levels such that a general increase would occur in the conservation pool storage in Wright Patman and a general decrease in Cooper, and, 2) the net effect in Cooper would be a drawdown during the growing season. We find this may not be the pattern. We contacted FNI. No information was provided other than they were waiting to receive recommendations from TPWD staff. We were told to provide water management recommendations that are beneficial to management for fish and wildlife. This task is complicated by several sectors for which we have no information. These unknowns of hydroperiod dynamics, include: 1) the magnitude of water level change (2) the duration of water level change, including storage and withdrawal (hydroperiod frequency), 3) dates of water level changes (hydroperiod seasonality), 4) rates of water level changes, and 5) acreage affected. We request that these points be considered as our recommendations are reviewed.

Management Strategies:

In this section, we describe management strategies that are employed to focus on wetlands or lands that simulate wetlands. In these strategies, we encourage manipulations of water levels that affect phenomena associated with wetland functions and values. These strategies address: 1) stream conditions, 2) moist soil management for waterfowl, 3) perennial emergent marshes, 4) combinations of #2 and #3, and 5) mudflats for shorebirds. Discussions of these points follow.

We believe increased water levels within the channels of the White Oak Creek and Sulphur River systems can be beneficial. Through nutrient cycles and food webs, improved conditions for aquatic biota also can generate benefits for terrestrial communities. We have some concerns that prolonged bank-full stream conditions can influence the water table sufficiently to cause widespread stress or mortality of trees in bottomland hardwood forests. In fact, this situation may result at some stream level threshold less than bank-full conditions. Therefore, we also offer some caution to the status of floodplain water tables even as we acknowledge the beneficial effects of increased flow in the stream channels. More information is needed about water table effects. Nonetheless, management to improve stream flow is useful.

Moist soil management involves an assemblage of techniques that simulate natural drawdowns during the growing season followed by shallow flooding during the dormant season. The desired outcome of this management approach is to encourage annual herbaceous plant communities that produce abundant seed yields that serve as available foods attractive to wintering dabbling ducks. In this methodology, seeds are captured in place for use as duck foods. Moist soil management is a dynamic strategy requiring annual assessments and applications of certain techniques that may vary each season.

Management for perennial emergent marshes can be less intense than moist soil management. Perennial emergent plant communities usually prosper when fluctuations of water levels are minimal in shallow wetlands. Some food production for wintering ducks can be achieved. However, these cover types are more important as brood and molting habitat for wood ducks, foraging habitat for wading birds and wetland-related mammals, breeding habitat for reptiles and amphibians, nursery habitat for fish, and a multitude of life requisites for aquatic invertebrates.

In many situations, opportunities exist to apply a combination of management techniques to produce a mosaic of cover types at a locale. This is a desirable outcome. It may have good potential along with stream maintenance in the proposed water exchange project.

Also, we consider that a native seedbank exists on-site for both annual and perennial plant species. Drawdowns during midsummer (July) are not recommended because of vulnerability to pest plants such as cocklebur and sumpweed. Artificial seeding of Japanese millet can be a viable contingency option in the event large expanses of mudflats are exposed during this inopportune period. Seeding rates of 15-20 pounds/acre on fresh mudflats can produce high yields of seed attractive to ducks. An approach akin to this is used on the Oklahoma portion of Lake Texoma.

Under management for both moist soil and perennial emergent communities, attention must be maintained for degradation of desired results by undesirable pest plants.

In addition to management activities that address stream resources of herbaceous plant communities, foraging habitat for shorebirds is produced by correctly timed dewatering of shallow wetlands. This is done to increase the amount of mudflats where shorebirds can find available invertebrates foods in the saturated soils or

thin film of very shallow water. Shorebird migrations peak in this locale in late winter/early spring and during late summer/early fall. Exposure of mudflats during spring and late summer will be beneficial to shorebirds expected in this locale. This technique can be applied at both reservoirs.

Drawdowns to benefit shorebirds should be rapid and incremental. Several rapid decreases in water levels by about 6 – 12 inches can be used to lengthen the availability of food resources throughout the migration period. This incremental method is more favorable than one large decrease in water depth of more than 1-3 feet.

Positive Effects:

Wright Patman

At this time, we envision no significant undesirable effects from moderate increases in water levels in Wright Patman Reservoir. This assessment is given with the consideration that water levels will not be increased to the extent that adjacent stands of trees will be damaged.

Shallow flooding of the perimeter zone below the treeline is expected to promote plant communities typified by herbaceous perennial emergents and wetland shrubs.

Sulphur River, White Oak, and White Oak Creek WMA

We believe increasing the volume of water in the streams is desirable. This will benefit aquatic resources and, consequently, terrestrial fauna that utilize them. We speculate that the periodicity of natural floods can increase; this is generally beneficial as long as bottomland hardwoods are not damaged.

Cooper Lake/Cooper WMA

Withdrawal of water from Cooper during the growing season can be beneficial in encouraging extensive stands of annual plant species that produce foods for ducks. The potential exists for substantial acreage to be affected positively. The most desirable drawdowns are early season (late January – early March). Mid-season drawdowns (mid-March – early May) also can produce excellent results when pest plants can be suppressed.

Rapid late summer drawdowns (August – mid-September) that are conducted in several increments produce mudflats that are used heavily by migrating shorebirds. Also, shorebirds feed on mudflats in spring before vegetative cover is too thick. This benefit is consistent with early or midseason drawdowns conducted to encourage annual plants useful for producing duck foods.

Lowering water levels in Cooper Lake can allow moist soil management practices to be applied to the constructed wetland units on Cooper WMA. This is desirable, given that water is available for dormant season flooding.

Negative Effects:

Wright Patman Reservoir, Sulphur River, White Oak Creek,
White Oak Creek WMA

The effect of increased lake levels on associated water tables is unknown. Observations at some local sites where surface water remains pooled indicate that adjacent water tables can be raised. Mortality and stress on nearby trees is noted. The conclusion from these observations is that the water table is raised sufficiently to saturate the root zone, thus reducing or eliminating oxygen in the soil. Widespread occurrence of this situation could result in substantial negative

impacts to bottomland hardwoods. More information is needed on the effects on water tables in order to predict acceptable increases in water levels.

We wish to note that the scope of management can involve many species and/or guilds of wildlife. Life requisites differ widely among these species. Therefore, negative effects may be realized for some species while benefits are generated for others. More specific management for target species or guilds can be prescribed as more information becomes available about the water management operations. This circumstance can be resolved with further dialog.

On White Oak Creek WMA, floodplain creeks and sloughs are influenced by water levels in White Oak Creek. When water levels in these streams reach elevations associated with water control structures on the created wetlands, discharge of water from the units would be hindered or prevented.. This can have negative effects on the management activities at this site. Generally, discharges are necessary from late winter throughout the growing season. Additionally, the integrity of the levees at this site could be affected by excessive saturation from increased water levels. This can result in an added maintenance expense and manpower burden for TPWD. A contingency fund provided by the project sponsor is recommended in case this saturation condition is unavoidable.

Cooper Lake/Cooper WMA

The potential for growth of pest plants and/or encroachment of undesirable woody vegetation depends on the timing and duration of reductions in water levels. This situation ultimately could prevail, especially in circumstances when efforts are made to conduct a combination of moist soil management in concert with maintenance of perennial emergent communities.

Unacceptable Effects:

1. Excessive permanent flooding during the growing season in all water bodies is considered unacceptable for the welfare of wetland-associated wildlife and habitats.

2. Seasonal flooding that is reasonably in accord with natural hydroperiods is desirable. Any operations that disrupt this beneficial pattern is considered unacceptable.

3. Any additional storage above the conservation pools of both reservoirs that directly floods adjacent forests during the growing season will have an unacceptable negative effect. Likewise, stream volume that causes root zone saturation via water table transport during the growing season is expected to result in unacceptable conditions.

4. At White Oak Creek WMA and Cooper WMA, any actions resulting in damage to existing infrastructure (especially levees and water control devices) will be unacceptable. Prevention of this situation or repair necessary from adverse water management operations should be considered the sole responsibility of the COE. Recognition should be made that the current TPWD contract is to manage these areas consistent with existing reservoir operations.

5. Any operational changes that detract from gains made thus far in wildlife habitat conditions and infrastructure improvements are considered unacceptable.

Conclusion:

The difficulty of developing management recommendations with a modest amount of information is prodigious. For this reason, we qualify our material with the

recognition that improvements and adjustments can be made in a continued spirit of optimizing fish and wildlife benefits as more specific useful information becomes available.

Additionally, we wish to express our concern that these recommendations could be used to adversely affect natural resource conservation by rejecting a management plan for water exchange in favor of new reservoir construction. This outcome could have serious deleterious effects on further collaborative efforts in projects for water supply and fish and wildlife conservation. Therefore, continued efforts toward compatibility in the water exchange objectives for the existing reservoirs are encouraged.

Finally, recognition is made of the potential for this project to serve the goals and objectives of the respective integrated bird conservation plans and operations generated by the West Gulf Coastal Plain Initiative of the Lower Mississippi Joint Venture. This joint venture is a major endeavor that has evolved from the North American Waterfowl Management Plan. With the advent of the North American Bird Conservation Initiative; these activities now seek to integrate goals, strategies, and objectives from the respective national and regional plans for landbirds, shorebirds, and waterbirds. The application of this water management project to this large and important national bird conservation effort should not be overlooked.