5.8 Wetlands

5.8.1 Introduction

This section evaluates impacts on wetland locations, types, and functions for the Base Case and the policy alternatives. Because the individual alternatives would not affect all reservoirs in the same way, each policy alternative would not affect all wetlands associated with the reservoir system. Over time, changes in the timing and duration of surface water and soil saturation could change the locations, types, and functions—and as a result, the extents and distributions—of wetlands and the social, environmental, and economic values they provide.

Changes in wetland extent, distribution, and habitat connectivity would occur as conditions become wetter or drier. These changes include both short-term changes (changes that may occur within a decade or two) and long-term changes (changes that may continue over many decades or even centuries). Where increasing duration of water is an effect, there may be no place for wetlands to shift or expand into due to shoreline development or topography. In these areas, certain types of wetlands may be lost permanently.

Wetland vegetation types are generally adapted to particular water regimes; either too much or too little water can adversely affect all types of wetland vegetation. For example, flats and aquatic beds would be affected by changes in the timing and duration of exposure to water. Increased periods of exposure may reduce the extent of aquatic bed vegetation. Decreased periods of exposure may reduce the period of time available for the annual plant species that colonize flats (non-persistent emergents) to complete their lifecycles and set seed for subsequent generations.

The woody vegetation of forested and scrub/shrub wetlands is particularly sensitive to increased duration of water, which may result in loss of existing shrubs and trees, or slow attrition when seeds are prevented from germinating and establishing within the community to replace older individuals that have died. Some of these woody wetland vegetation types (particularly buttonbush scrub/shrub wetlands) may not be able to shift into new locations because current management regimes and climatic conditions are no longer favorable for their establishment. On the other hand, reduction in the level and duration of water may allow wetland vegetation to be invaded by upland or non-native species, changing vegetation composition and function.

The effects on water regimes were considered separately from the effects on wetland vegetation types, because the effects in many cases are different. Increased availability of water was assumed to enhance all wetland water regimes, and decreasing availability of water was assumed to diminish all wetland water regimes.

5.8.2 Impact Assessment Methods

Potentially affected wetlands were identified based on their occurrence within a projected groundwater area of influence. The groundwater area of influence was projected based on geologic modeling of the distance at which reservoir water levels cease to affect groundwater levels in each physiographic region in the study area (see Section 5.6 [Groundwater Resources] and Appendices D2 and D4a). In karst areas (limestone geology), this groundwater area of influence may fail to include a small number (statistically insignificant) of wetlands associated with affected springs and seeps that occur at a great distance from the reservoirs and tailwaters.

In general, the policy alternatives would affect mainstem and tributary systems differently. Different types of wetlands would be affected differently under each policy alternative, and these different types of wetlands are not distributed evenly among the individual reservoirs and tailwaters. For the purpose of comparison, reservoirs and tailwaters were assessed individually; and changes in mainstem reservoirs, tributary reservoirs, mainstem tailwaters, and tributary tailwaters, were compared separately.

Existing research and data did not permit quantification of potential changes in wetland extents (size and location) that might occur during the study period. Therefore, levels of impact were assessed according to the number of existing acres of wetlands that would be enhanced in function versus the number of acres that would be diminished in function. This method of assessment measures changes that would occur in the immediate future (in 1 to 5 years). The effects of the alternatives were compared by using the acreages of the affected types of wetlands weighted with a measure of the magnitude of the change caused by each alternative, and with the direction of the change (positive, zero, or negative impact) based on the alternative and the type of wetland.

For each alternative, mean changes in summer pool levels (duration and maximum elevation) and winter pool (maximum elevation) levels were compared with conditions under the Base Case to determine the magnitude of change each alternative would cause on water availability in wetlands. Changes in mainstem and tributary reservoirs were assessed separately. This magnitude of change was used to assess the degree to which proposed changes might affect wetland types and wetland functions. Changes in filling dates to reach summer pool were also evaluated. The Base Case was assigned a magnitude of zero for comparison.

For tailwaters, data generated by the water quality model was used to determine the magnitude of change each alternative would cause on water availability in wetlands. Relevant data from this analysis included minimum surface water elevations that are expected to occur during 90 percent of the year in tailwaters below dams. Mainstem and tributary tailwaters were evaluated separately because this modeling indicated that proposed changes in tailwaters would vary considerably between these two groups.

5.8.3 Base Case

Under the Base Case, wetlands would continue to follow existing trends. Overall, there would be minor but steady changes in wetland extents and distributions, shifts in wetland types, and a slow decline in wetland functions.

Wetland Location. Minor but steady declines in the extents and distributions of wetlands would continue, as discussed in Section 4.8. This decline in wetland extents and distributions also would result in a decrease in habitat connectivity.

Wetland Type. Wetland vegetation types are expected to follow existing trends. In general, acreage of scrub/shrub wetlands would increase, and the habitat quality and acreage of persistent emergent and forested wetlands would decline. National trend data for aquatic beds and flats are not available; however, TVA data show cyclical fluctuations in aquatic beds (see Section 4.9, Aquatic Plants) with large increases in coverage since the early 1960s following the introduction and establishment of Eurasian watermilfoil and more recently other invasive species such as hydrilla.

All wetland water regimes, shoreline wetlands, and surface-isolated wetlands are expected to follow existing trends. More than 22,000 acres of wetlands with controlled water levels on several reservoirs are expected to follow existing trends influenced by routine reservoir fluctuations (Table 4.8-02).

Wetland Function. Loss or degradation of wetland extents, distributions, and types would result in a general decline in all wetland functions. This would adversely affect wetland functions related to water quality, floodwater and stormwater storage, shoreline/bank stabilization and erosion control, carbon storage, wetland-upland community interspersion, and public use.

5.8.4 Reservoir Recreation Alternative A and Tailwater Habitat Alternative

Reservoir Recreation Alternative A would generally increase the availability of water by 4 to 7 weeks during the growing season, relative to the Base Case. This could cause slight shifts in the extents and distributions of wetlands and wetland types. The changes in the timing of the presence of water would adversely affect flats, scrub/shrub, and some forested wetlands. There would be a slight decrease in wetland functions. The Tailwater Habitat Alternative would result in some effects similar to those described for Reservoir Recreation Alternative A, especially on mainstem reservoirs. However, changes in water availability and wetland types would be more pronounced on tributaries under the Tailwater Habitat Alternative, where the duration of summer pool levels on affected reservoirs would increase up to 24 weeks longer than conditions under the Base Case and up to 16 weeks longer than under Reservoir Recreation Alternative A (see Appendix D4b for additional details).

Wetland Location. Over time, changes in the timing and duration of surface water and soil saturation under Reservoir Recreation Alternative A and the Tailwater Habitat Alternative would lead to slight increases in the extents and distributions of wetlands. Similar increases in wetland habitat connectivity would occur.

Wetland Type. Under Reservoir Recreation Alternative A, the extended duration of summer pool levels would positively affect aquatic bed and emergent wetlands, because more water would be available during the growing season to wetlands on affected mainstem and tributary reservoirs and tailwaters. Aquatic beds may experience some decline in deeper water zones, but this loss may be offset by expansion of submersed aquatic plants into the drawdown zone. The additional time that water is present in the wetland during the growing season would negatively affect flats, scrub/shrub, and some forested wetlands. Some already stressed forested wetlands would be stressed beyond existing conditions. Overall, Reservoir Recreation Alternative A would result in a negative effect on wetland vegetation types. The types of impacts resulting from the Tailwater Habitat Alternative would generally be the same as those for Reservoir Recreation Alternative A, but the magnitude of adverse impacts would be greater compared to those under Reservoir Recreation Alternative A.

The extended duration of summer pool levels on affected mainstem and tributary reservoirs and tailwaters would increase availability of water in all wetland water regimes, shoreline wetlands, and surface-isolated wetlands in the groundwater influence zone.

The increase in winter pool elevations could interfere with controlled wetlands on Wheeler and Douglas Reservoirs. Increases in winter pool elevations could interfere with dewatering efforts in managed wetlands on affected reservoirs. Late-season flooding on these reservoirs could also jeopardize crops planted for wildlife. Adverse impacts could increase costs to invested agencies, including maintenance and replacement costs of associated infrastructure (such as access roads, signage, levees, pumps, and monitoring equipment) (see Section 4.8.3 for more details).

Wetland Function. Systemwide, Reservoir Recreation Alternative A and the Tailwater Habitat Alternative would result in a net moderate decrease in wetland functions related to floodwater and stormwater storage and water quality because of changes in wetland extents, distributions, and types. A moderate increase in wetland functions related to shoreline/bank stabilization and erosion control, carbon storage, wetland-upland community interspersion, and all other general functions provided by all wetland types may result from changes in wetland extents, distributions, and types.

5.8.5 Reservoir Recreation Alternative B and Tailwater Recreation Alternative

Reservoir Recreation Alternative B and the Tailwater Recreation Alternative would cause a major increase in the availability of water from 9 to 11 weeks during the growing season; this could cause moderate shifts in the extents and distributions of wetlands and wetland types (Appendix D4b). The changes in the timing of the presence of water would adversely affect flats, scrub/shrub, and forested wetlands. Changes would occur faster than wetland plant communities could adapt. There would be an overall decrease in wetland functions.

Wetland Location. Over time, changes in the timing and duration of surface water and soil saturation could lead to minor increases in the extents and distributions of wetlands. Similar increases in habitat connectivity would occur.

Wetland Type. Under Reservoir Recreation Alternative B and the Tailwater Recreation Alternative, the extended duration of summer pool levels would positively affect aquatic bed and emergent wetlands because more water would be available during the growing season to wetlands on affected mainstem and tributary reservoirs and tailwaters. The additional time that water is present in the wetland during the growing season would negatively affect flats, scrub/shrub, and forested wetlands. Many affected scrub/shrub and forested wetlands would die back faster than they would expand into new suitable habitat. In areas where expansion could occur, scrub/shrub communities might develop within 5 to 10 years; forests would require a period of decades to reach maturity. Overall, Reservoir Recreation Alternative B and the Tailwater Recreation Alternative would negatively affect wetland vegetation types.

The extended duration of summer pool levels on affected mainstem and tributary reservoirs and tailwaters would increase availability of water in all wetland water regimes, shoreline wetlands, and surface-isolated wetlands in the groundwater influence zone.

The increase in winter pool elevations could interfere with those wetlands with controlled water levels on Kentucky, Wheeler, and Douglas Reservoirs.

Wetland Function. Systemwide, Reservoir Recreation Alternative B and the Tailwater Recreation Alternative would result in a net moderate decrease in wetland functions related to floodwater and stormwater storage and water quality due to changes in wetland extents, distributions, and types. A moderate increase in wetland functions related to shoreline/bank stabilization and erosion control, carbon storage, wetland-upland community interspersion, and all other general functions provided by all wetland types may result from changes in wetland extents, distributions, and types.

5.8.6 Summer Hydropower Alternative

The Summer Hydropower Alternative would decrease the mean summer pool duration on reservoirs for about 10 weeks (range -4 to -25 weeks), thus reducing the availability of water in wetlands during the growing season (Appendix D4b). This would result in major shifts or losses in wetland extents and distributions, degradation of most vegetated wetlands, and major loss of wetland functions. Changes would occur faster than wetland plant communities could adapt. Overall, the Summer Hydropower Alternative would result in the most adverse effects on wetlands of all of the alternatives.

Wetland Location. Over time, changes in the timing and duration of surface water and soil saturation would lead to substantial decreases in the extents and distributions of wetlands. Similar decreases in habitat connectivity also would occur.

Wetland Type. The reduction in summer pool levels would adversely affect aquatic beds and persistent emergent, scrub/shrub, and forested wetlands of all affected reservoirs and tailwaters. Overall, the Summer Hydropower Alternative would adversely affect wetland vegetation types.

The reduction in water availability during spring and summer would potentially positively affect flats because they would be exposed earlier in the year. However, too much exposure of flats could dry them out so that insufficient moisture remains for germination of seeds of nonpersistent emergent plants. On mainstem and tributary reservoirs, the decreased water availability would negatively affect aquatic bed, emergent, and forested wetlands, because there would not be enough water during the growing season to support these wetland plants. Potential effects on scrub/shrub wetlands could be either positive or negative depending on drawdown rates and summer pool management in reservoirs. If drawdown rates proceed slowly, these vegetation types may expand into the drawdown zone. If drawdown rates increase too quickly or erratically, these important wetlands could lose their most important source of water and dry up before they could migrate into other suitable habitat.

The earlier drawdown and shorter summer pool duration on affected mainstem and tributary reservoirs would decrease availability of water in all wetland water regimes, shoreline wetlands, and surface-isolated wetlands in the groundwater influence zone. The increase in winter pool elevations could interfere with wetlands with controlled water levels on Douglas Reservoir.

Wetland Function. Systemwide, the Summer Hydropower Alternative would result in a substantial increase in summer floodwater and stormwater storage function of wetlands, because less water would be stored in affected reservoirs during summer months. A major decrease in wetland functions related to water quality, shoreline/bank stabilization and erosion control, carbon storage, wetland-upland community interspersion, and other general functions provided by all wetland types may result from changes in wetland extents, distributions, and types.

5.8.7 Equalized Summer/Winter Flood Risk Alternative

The Equalized Summer/Winter Flood Risk Alternative would change the mean summer pool duration by -11 to +8 weeks on affected reservoirs compared to the Base Case. On mainstem reservoirs, summer filling dates would be delayed from 4 to 7 weeks. On tributary reservoirs, summer pool elevations would change from -21 to +3 feet relative to the Base Case (Appendix D4b). These changes in water availability would greatly alter the timing and availability of water during the growing season for most wetlands. This would result in damage to scrub/shrub and forested wetlands, particularly on tributary reservoirs where these wetland types are already limited in abundance and extent. Changes would occur faster than wetland plant communities could adapt.

Wetland Location. Over time, changes in the timing and duration of surface water and soil saturation would lead to major decreases in the extents and distributions of wetlands. Similar decreases in habitat connectivity would occur.

Wetland Type. By delaying summer pool filling dates on both mainstem and tributary reservoirs and having lower summer pool elevations on tributary reservoirs, aquatic beds, scrub/shrub, and forested wetlands on all affected reservoirs and tailwaters would be adversely affected.

The impact analysis methodology shows potential enhancement to flats in mainstem reservoirs and tailwaters and tributary reservoirs under the Equalized Summer/Winter Flood Risk Alternative. In general, lower summer water levels, especially on tributary reservoirs, would expose flats more during the year; but there is valid concern that too much summer drying would deplete the soil moisture necessary for seed germination and growth of non-persistent emergent plants. Higher winter pool elevations would drown out plants that were able to begin establishing themselves on exposed flats. The increased exposure of flats might also increase the opportunity for upland or invasive plants to colonize exposed flats. Because of these factors, the overall effect for flats would be adverse, and the overall effect for aquatic beds would be variable on tributary reservoirs under the Equalized Summer/Winter Flood Risk Alternative.

Impacts on scrub/shrub and forested wetlands would be especially harmful on tributary reservoirs where these vegetation types are somewhat uncommon. The decrease in summer pool elevations on tributary reservoirs would isolate these wetlands from their most important source of water, resulting in a net loss of these wetlands on affected reservoirs. Changes in water regimes would occur faster than these wetland types could adapt to new conditions.

The reduction in water availability during spring and early summer would negatively affect aquatic bed, flats, emergent, scrub/shrub, and forested wetlands because there would not be enough water during the growing season to support these wetland plants. Overall, effects of the Equalized Summer/Winter Flood Risk Alternative would result in negative system-wide impacts on wetland vegetation types.

On affected mainstem and tributary reservoirs and tailwaters, the reduced availability of water in all wetland water regimes would adversely affect shoreline wetlands and surface-isolated wetlands in the groundwater influence zone. The increase in winter pool elevations on Wheeler and Douglas Reservoirs could interfere with wetlands having controlled water levels on these reservoirs.

Wetland Function. Loss or degradation of wetland extents, distributions, and types would result in a major decrease in all wetland functions. This would adversely affect wetland functions related to water quality, floodwater and stormwater storage, shoreline/bank stabilization and erosion control, carbon storage, wetland-upland community interspersion, and public use.

5.8.8 Commercial Navigation Alternative

The Commercial Navigation Alternative would increase winter pool levels up to 2 feet over Base Case conditions on seven mainstem reservoirs (Appendix D4b). This increase would cause minor changes in water availability. Effects on wetland extents, distributions, types, and functions would be minor. The increase in winter pool levels on affected reservoirs would primarily reduce exposure of flats during winter months. Higher winter pools would also have slightly adverse effects on scrub/shrub and forested wetland types. The Commercial Navigation Alternative would not affect flood and stormwater storage, carbon storage, wetland-upland community interspersion, and all other general wetland functions

5.8.9 Preferred Alternative

The Preferred Alternative would extend the duration of summer pool on most reservoirs and delay spring fill dates on three mainstem reservoirs (Chickamauga, Watts Bar, and Fort Loudoun). The Preferred Alternative would generally increase the availability of water by 4 to 9 weeks during the growing season on affected reservoirs. This could cause slight shifts in the extents and distributions of wetlands and wetland types. Changes in the timing of the presence of water would adversely affect vegetated flats, scrub/shrub, and certain forested wetlands. There would be a slight decrease in wetland functions. The Preferred Alternative would result in effects that are similar to but less than those described for Reservoir Recreation Alternative A and the Tailwater Habitat Alternative (see Appendix D4b for additional details).

Wetland Location. Over time, changes in the timing and duration of surface water and soil saturation under the Preferred Alternative could lead to slight increases in the extents and distributions of wetlands. There could be some opportunities for new wetlands to develop as a result of the extension of summer pools. These opportunities for increases would be limited, because the capillary fringe would not extend much beyond its current extent. Other limiting factors for new wetland formation are the availability of suitable soils, topography, and suitable landforms. Any increase in extent of wetlands could lead to similar increases in wetland habitat connectivity.

Wetland Type. The additional time that water is present in wetlands during the growing season would adversely affect flats, scrub/shrub, and many forested wetlands and would positively affect aquatic bed and persistent emergent wetlands. Many flats, especially those supporting nonpersistent emergent wetlands, would be limited in their exposure and development. Many nonpersistent emergent communities could revert to unvegetated flats, because they could not complete their growth cycles and produce viable seed. Eventually these nonpersistent wetland communities could die off and be replaced by upland species or exotic, invasive pest plants.

Scrub/shrub and forested wetlands that are currently under extreme environmental stress (e.g., buttonbush swamps) would not respond well to prolonged flooding. Many scrub/shrub communities could die off and be replaced by aquatic beds in the drawdown zone and emergent communities in drier habitat.

Increased availability of water during the growing season could stress trees in temporarily and seasonally flooded or saturated forested wetlands to the point that they begin to die. Dominated tree species in these wetland types are not adapted to prolonged flooding or soil saturation. Many temporarily and seasonally flooded or saturated forested wetlands could convert to scrub/shrub and emergent communities in the ROS planning period to year 2030. Eventually, more water-tolerant tree species may colonize these wetter sites, but new forested wetlands would require many decades to develop and mature.

Changes in aquatic beds would likely be positive because of longer summer pools, but the health and vigor of aquatic beds depend on many environmental factors in addition to water levels (see Section 5.9, Aquatic Plants). Persistent emergent wetlands would likely adapt well to the extension of summer pool conditions due to their ability to withstand prolonged flooding and/or soil saturation and adaptations that allow them to reproduce vegetatively as well as by seed dispersal.

Over time, the Preferred Alternative could produce some major shifts in distribution of wetland types. Negative effects on flats, scrub/shrub, and forested wetlands would persist. Overall, the Preferred Alternative would result in a negative effect on wetland vegetation types. Effects would be negative on vegetation types of mainstem reservoirs, mainstem tailwaters, and tributary reservoirs, and neutral on tributary tailwaters.

Because winter pool levels would not change relative to the Base Case, wetlands with artificially controlled water levels would not be affected by the Preferred Alternative.

Wetland Function. Systemwide, the Preferred Alternative would result in a net moderate decrease in wetland functions related to floodwater and stormwater storage and water quality due to changes in wetland extents, distributions, and types. A moderate increase in wetland functions related to shoreline/bank stabilization and erosion control, carbon storage, wetland-upland community interspersion, and all other general functions provided by all wetland types may result from changes in wetland extents, distributions, and types.

5.8.10 Summary of Impacts

The largest impacts of the proposed alternatives are the potential effects on wetland extents and wetland vegetation types (Table 5.8-01). These changes in wetland extents and types would result in corresponding changes in wetland functions and the social, environmental, and economic values they provide. Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, the Tailwater Recreation Alternative, the Tailwater Habitat Alternative, and the Preferred Alternative would increase the availability of water to wetlands. The changes in the availability of water to wetlands would improve opportunities for some new wetlands to develop in suitable habitat. However, the same changes that would encourage new wetland formation would adversely affect existing wetland vegetation types, in particular flats, scrub/shrub, and forested wetlands. Wetland vegetation types dominated by woody plants (scrub/shrub and forested wetlands) would require decades to recover from these changes. Forested wetlands would be particularly slow to recover, because trees require decades to become established and reach maturity.

The Summer Hydropower Alternative and the Equalized Summer/Winter Flood Risk Alternative would result in negative impacts on both wetland extents and types. Both of these alternatives would result in an overall decrease in availability of water to wetlands during the growing season. Under the Equalized Summer/Winter Flood Risk Alternative, the decrease in summer pool elevations on tributary reservoirs would isolate these wetlands from their most prevalent source of water. This hydrologic isolation would effectively eliminate scrub/shrub and forested wetlands from tributary reservoirs. Both the Summer Hydropower Alternative and the Equalized Summer/Winter Flood Risk Alternative would adversely affect scrub/shrub and forested wetland communities on tributary reservoirs.

The Base Case and the Commercial Navigation Alternative would result in the least adverse impacts on wetlands on both mainstem and tributary reservoirs and tailwaters.

Overall, Reservoir Recreation Alternative A, Reservoir Recreation Alternative B, the Summer Hydropower Alternative, the Equalized Summer/Winter Flood Risk Alternative, the Tailwater Recreation Alternative, the Tailwater Habitat Alternative, and the Preferred Alternative would result in negative effects on wetlands. The Summer Hydropower Alternative would result in the most adverse impacts compared to the other alternatives. The Base Case and the Commercial Navigation Alternative would result in the greatest possible net positive impacts on wetlands.

Table 5.8-01 Summary of Impacts on Wetland Resources by Policy Alternative

Alternative	Description of Impacts
Base Case	No change – Wetlands would continue to follow existing trends. There would be minor but steady changes in wetland extents and distributions, shifts in wetland types, and a slow decline in wetland functions overall.
Reservoir Recreation A	Slightly adverse – The availability of water would generally increase during the growing season. This would cause slight shifts in the extents and distributions of wetlands and wetland types. The changes in the timing of the presence of water would adversely affect flats, scrub/shrub and forested wetlands. However, there would be positive effects on aquatic bed and persistent emergent wetlands. There would be a slight decrease in wetland functions overall.
Reservoir Recreation B	Adverse – The major increase in the availability of water during the growing season would cause moderate shifts in the extents and distributions of wetlands and wetland types. The changes in the timing of the presence of water would adversely affect flats, scrub/shrub and forested wetlands. Changes would occur faster than wetland plant communities could adapt However, there would be positive effects on aquatic bed wetlands. There would be a moderate decrease in wetland functions overall.
Summer Hydropower	Substantially adverse – The availability of water would be greatly decreased in wetlands during the growing season. This would result in major shifts or losses in wetland extents and distributions and the degradation of most vegetated wetlands, resulting in a major loss in wetland functions.
Equalized Summer/Winter Flood Risk	Substantially adverse – The timing and availability of water would be reduced in wetlands during the growing season for most wetlands. This would result in adverse effects on flats, scrub/shrub and forested wetlands, particularly on reservoirs where they are already limited in abundance. Changes would occur faster than wetland plant communities could adapt. There would be a major decrease in wetland functions overall.
Commercial Navigation	No change – There would be minor changes in water availability. Effects on wetland extents, distributions, types, and functions would be similar to the Base Case. The Commercial Navigation Alternative would affect wetlands at the least number of reservoirs.
Tailwater Recreation	Adverse – There would be a major increase in the availability of water during the growing season that would cause moderate shifts in the extents and distributions of wetlands and wetland types. Changes in the timing of the presence of water would adversely affect flats, scrub/shrub and forested wetlands. Changes would occur faster than wetland plant communities could adapt. However, there would be positive effects on aquatic bed wetlands. There would be a moderate decrease in wetland functions overall.
Tailwater Habitat	Slightly adverse – The availability of water would generally increase during the growing season. This would cause slight shifts in the extents and distributions of wetlands and wetland types. The changes in the timing of the presence of water would adversely affect flats, scrub/shrub and forested wetlands. However, there would be positive effects on aquatic bed and persistent emergent wetlands. There would be a slight decrease in wetland functions overall.
Preferred	Slightly adverse – The availability of water would generally increase during the growing season. This would cause slight shifts in the extents and distributions of wetlands and wetland types. The changes in the timing of the presence of water would adversely affect flats, scrub/shrub and forested wetlands. However, there would be positive effects on aquatic bed wetlands. There would be a slight decrease in wetland functions overall.

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