Department of Fisheries and Wildlife
Oregon State University, 104 Nash Hall, Corvallis, Oregon 97331-3803
T 541.737.2465 | F 541.737.3590 | E bruce.dugger@oregonstate.edu/

District Engineer
US Army Engineer District, Memphis
Attn: Project Management Branch (SJNM)
167 North Main Street, B-202
Memphis, TN 38103-1894

25 November 2013

SUBJECT: Comments on the July 2013 Draft Environmental Impact Statement for the St. Johns Bayou and New Madrid Floodway Project

Dear Colonel Anderson,

I have previously provided comments and testimony regarding the St. Johns Bayou/New Madrid Floodway project and its impacts on waterfowl and shorebirds. I provided comments on earlier versions of the environmental impact statement, including the Revised Supplemental EIS2 (December 2005).

I am Associate Professor in the Department of Fisheries and Wildlife at Oregon State University and have been conducting research on the ecology, conservation, and management of waterfowl since 1987, including work in the Mississippi Alluvial Valley in Arkansas and Missouri. I have 22 peer reviewed publications since 2000 dealing with aspects of waterfowl and wetland ecology, many of which directly relate to issues germane to the proposed project. In my position as a university professor I teach or have taught courses in wetland ecology and management, waterfowl ecology, avian ecology, and ornithology.

In this letter I provide comments on the new waterfowl and shorebird analyses of project impacts and mitigation. I appreciate that the US Army Corps of Engineers (hereafter referred to as the Corp) developed a more specific process for calculating DUDs and included an external scientific review of the biological models used to estimate impacts and that the Corp's new WAM analysis is based on a more rigorous effort to characterize the foraging value of various habitat types in their calculations of DUDs. However, this improvement does not overcome all of my concerns and leads me to conclude that the proposed mitigation will not replace all the lost functions and values provided by the current system.

I. Waterfowl

General description of site as being important to waterfowl

The New Madrid Floodway/St. Johns Bayou area lies at the northern end of the Mississippi Alluvial Valley (MAV), one the most significant areas for migrating and wintering waterfowl in

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North America (Bellrose 1980). More than 80% of the historic wetlands in the Lower MAV have been lost, which makes the remaining wetlands exceedingly valuable (Fredrickson 1978). Common waterfowl using the area during the non-breeding season include Mallard (*Anas platyrhynchos*), Wood Duck (*Aix sponsa*), Northern Pintail (*Anas acuta*), Green-winged Teal (*A. crecca*), Northern Shoveler (*A. clypeata*), Gadwall (*A. strepera*), American Wigeon (*A. americana*), Blue-winged Teal (*A. discors*), Lesser Scaup (*Aythya affinis*), Ring-necked duck (*A. collaris*) and Hooded Merganser (*Lophodytes cucullatus*). Wood Ducks are common breeders and Hooded Mergansers are locally common breeders. Mallard and Blue-winged Teal also nest in the area in small numbers. These species rely on a diversity of wetland habitats including flooded forest, scrub-shrub, moist soil (seasonal herbaceous), flooded agricultural fields and open water during different times of the evaluation period (November 1 to March 31) to meet their nutritional and behavioral needs (Reinecke et al. 1989).

Waterfowl Assessment Model (WAM)

The current WAM that calculates Duck Use Days (DUD) and uses DUDs as the metric for comparing current project impacts to future scenarios is a significant improvement over the model contained in the previous DEIS. The WAM is a tool for calculating available food supplies for certain ducks likely to be provided by various habitats. The model relies on more recent data related to food production and a more recent understanding of the relationship between body size and Resting Metabolic Rate (Miller and Eadie 2006) than the previous DEIS. Having acknowledged that, there are several significant problems that are not addressed.

1. The mitigation emphasizes reforestation and the food supply for ducks that use forested habitats, the most common and abundant of which are mallards and wood ducks. That means the mitigation plan ignores ducks that do not commonly use forested wetlands, which are the substantial majority of duck species, and includes diving ducks as well as dabbling ducks that use more open habitats. Although mallards and wood ducks represent the majority of ducks using the project area, all duck species using the system need to be accounted for by the mitigation. While forested wetlands dominated the project area prior to human modifications, the large areas of open habitats created by conversion to agriculture has attracted and now support a more diverse group of species that need to be expressly considered in mitigation. There is nothing in the model to expressly recognize this dichotomy. Further, many of the DUD days post project are attributable to acorns and Mallards and Wood Ducks are the only waterfowl species that commonly consume acorns. Thus, food available to those species that do not eat acorns will further decline with mitigation. Moreover, the mitigation plan ignores the fact that reforestation represents a further reduction in usable acres to species like pintail that prefer more open habitats like seasonal herbaceous wetlands.

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2. Food is not the only factor that is important for valuing habitat. Relying solely on DUDs to assess project impacts assumes food is the only critical resource that should be considered when mitigating project impacts for waterfowl, which is not true. For example, February and March are critical to spring migrating waterfowl that are molting and acquiring energy reserves that will be used in migration and on the breeding grounds to form eggs. Behavioral patterns during this period indicate that compared to winter, birds in late winter and spring seek spatial isolation (Heitmeyer 1985), thus it takes more acres to support the same number of birds. Isolation can partially be achieved using vegetation, but not entirely. Similarly, survival is influenced by multiple factors that include disease, and disease transmission increases with bird density. Calculations of mitigation acres needed should include some consideration for the need for spatial isolation during the Feb-Mar period. Therefore, calculating mitigation acreage based solely on bird energy needs under represents what is actually needed to replace lost functions in the system.

3. Mitigation lands should be identified and acquired before project construction begins. The Corp has purchased one, 1,000 acre track (Bogle Woods); however, because acquisition is constrained by the need to buy from "willing sellers", there is no assurance the remaining lands will be acquired close to existing wetland areas for restoration, particularly lands already cleared for agriculture. Landowners provided with increased protection from flooding as a result of the proposed project may be unwilling to sell. Landowners may also be more reluctant to sell given recent increases in commodity prices driven in part by federal ethanol fuel standards. If these factors result in mitigation lands being distributed among small isolated tracts, the benefits to waterfowl and other wetland wildlife will be greatly reduced.

4. These problems are substantial. They mean that even if the mitigation plan adequately replaces food supplies for ducks that use forested wetlands, the mitigation does not address other duck needs or the needs of many duck species. As my testimony in a water quality certification hearing in Missouri goes into, the project area provides valuable habitat for these other species and the large reductions in flooding will greatly reduce that habitat. That testimony, which I understand is still a part of the record, remains valid. That means by definition that the mitigation does not offset the project impacts.

Mitigation plan

Table 16 of the Mitigation Technical Document (Appendix R) finds that the project and planned mitigation will result in an increase in 2.3 million DUDs in the New Madrid Basin during February and March. However, that conclusion relies in part on crediting duck habitat that already exists, and on some estimates of food values that I find questionable.

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a. 1.4 million of those DUDs are attributed to habitat at 10 Mile Pond, an area that already exists. Preservation or inclusion of existing lands as a mitigation strategy is, from a biological perspective, inappropriate as it does not replace lost wetland values for waterfowl.

b. The mitigation plan double counts seasonal herbaceous wetlands as providing value for both shorebirds and waterfowl. It is true that seasonal herbaceous wetlands provide habitat for waterfowl and shorebirds, but in practice managing such habitats to maximize their value for one taxa precludes maximizing their value for the other taxa (see explanation in shorebirds below). There is no consideration for such conflicts in the mitigation plan.

c. It is not clear how the value of batture lands was arrived at for mitigation because the documentation does not indicate how food values were arrived for such lands (Table 16, Appendix R). The Corp stipulates that batture areas will largely reforest to cottonwood and willow. Such species produce little food for waterfowl, which implies that these areas should produce few DUDs, yet, almost 1.8 million DUDs are attributed to this habitat type. Without additional justification for the value of batture areas, this habitat should not be counted. Moreover, deep flooding in batture area habitats may render what little food is produced unavailable to waterfowl.

d. Estimates of the project's impact on wetland losses assume ground water hydrology will not be significantly altered. However, it has been shown elsewhere that the channel modifications proposed in the project can lower ground water levels (Maki et al. 1980, Luckey 1985). If true, then wetland losses may be greater than predicted, which could significantly increase the project impacts on waterfowl. Although the Corps believes subsurface hydrology will not be significantly altered, the DEIS does not provide adequate documentation to verify their claim.

Even if additional information clarifies any or all of the issues raised above, given the foraging value of forested habitats is greatly dependent upon acorn production, project construction should not occur until mitigation lands have been planted long enough for trees to start producing acorns, which is not currently part of the mitigation plan.

Together, the issues raised above indicate the proposed mitigation will not fully compensate for lost habitat value from project construction.

II. Shorebirds

The connectivity between the river and floodplain in the New Madrid Floodway creates a unique wetland complex for migrating shorebirds along the Mississippi River Drainage. Although data about shorebird use of the project site are lacking, the large area of diverse floodplain wetlands scattered across the New Madrid Floodway/St. Johns Bayou area provides habitat for a wide

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range of shorebird species. Species commonly using floodplain wetlands in the project area include Pectoral Sandpiper (*Calidris melanotos*), Semipalmated Sandpiper (*Calidris pussila*), Least Sandpiper (*Calidris minutilla*), Lesser Yellowlegs (*Tringa flavipes*), Greater Yellowlegs (*Tringa melanoleuca*), and Common Snipe (*Gallinago gallinago*). Shorebirds require habitats that are shallow and sparsely vegetated, thus flooded agriculture wetlands and seasonal herbaceous (moist soil) wetlands are the most important resource to shorebirds in the project area. Although farmed wetlands have limited value for some species of wildlife, they offer valuable shorebird habitat because disking and plowing set back vegetation succession keeping these wetlands available for shorebirds (Helmers 1992).

The Corp has expressed the view that, because shorebirds did not historically occur in the project area, they are not obligated to mitigate for this group of species. They also state that failure to mitigate for shorebirds is not a problem because they "...would likely relocate to other agricultural fields, sand bars, and marshlands in the Mississippi River Valley and elsewhere." (DEIS Appendix R, pp 23-24). The statement begs the question " to which habitat are they referring?" The project area is the only reach along the lower Mississippi River where overbank flooding creates shorebird habitat in the floodplain; that fact provides evidence that this area is critically important for shorebirds and needs to be protected. I concur that forested wetlands should be emphasized in mitigation, but that does not justify ignoring impacts on shorebirds and waterfowl that will not use flooded forests.

As with the WAM model, the approach to assessing impacts to shorebirds has improved since the previous assessment conducted and expressed last in 2005 and 2006; however, the results from this analysis have been misapplied when generating the mitigation plan for shorebirds with the result being that the mitigation plan does not fully compensate for project related losses to shorebirds.

The shorebird assessment in the DEIS (Appendix H, part 1) estimates that under current conditions there is an average of 946 ha of suitable foraging habitat available **per day** during spring migration for shorebirds, with approximately 489 ha of that being rated as "optimal". The proposed project will reduce that value by around 30% in the St. John Basin and greater than 98% in the New Madrid Basin. The Corps claims that it could mitigate for these impacts through the almost permanent flooding for the 93 day shorebird season of a 1,286 acre parcel. The Corps then proposes to achieve this mitigation primarily by claiming credit for seasonal herbaceous wetlands already present at 10 Mile Pond plus several hundred acres of managed seasonally flooded agricultural habitats. There are several major problems with this plan:

a. As noted above for waterfowl, counting previously established habitat as mitigation does not replace lost wetland values. 10 Mile Pond already exists, so simply counting it towards mitigation does not mitigate anything.

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b. The Corp assumes that flooding roughly 1,000 acres for 93 consecutive days is equivalent to flooding a much larger area whose location moves in response to variable flooding and that on average provides 1,000 acres of shallow flooded habitat useable by shorebirds over those 93 days. That would only be true if the food supply were equivalent. Stagnant flooding on one site for 93 consecutive days increases the likelihood of food depletion, which lowers the value of that habitat patch over time. The shorebird model as constructed cannot be applied to such fundamentally different circumstances. It is possible that the depletion effects could be somewhat offset if the biomass of invertebrates would be initially higher in the managed area or invertebrate production in the managed area were high, but there are no data presented that justify either assumption and neither is likely to allow such a small area to match the food value of the much larger, naturally flooded project site.

c. Although the project claims shorebird value for 10 Mile Pond, it will not be possible to maximize the value of seasonal herbaceous wetlands concomitantly for waterfowl and shorebirds. At a minimum, the value of seasonal herbaceous habitats at 10 Mile Pond attributed to both shorebirds and waterfowl would need to be adjusted down. For example, traditional management of seasonal herbaceous wetlands (aka moist soil habitats) for waterfowl during fall migration and winter in the project area includes a spring drawdown the preceding season, which exposes soil and provides conditions for robust growth of herbaceous plants that provide foods like seeds and tubers. The vegetation is flooded during fall or early winter to make foods available to migrating waterfowl (Fredrickson and Taylor 1982, Fredrickson and Reid 1986). Robust emergent vegetation is not used by shorebirds, which feed on benthic invertebrates and require sparsely vegetated, very shallowly flooded habitats (Helmers 1992, Twedt et al. 1998).

   Thus, managing for fall migrating ducks lowers the value of seasonal herbaceous wetlands for shorebirds during the same period. By spring, much vegetation will have senesced creating suitable conditions for shorebirds, but some amount of vegetation will remain that continues to preclude use by shorebirds. Managing for maximum shorebird use of the same wetland would include a late summer mowing or disking of the plants that might interfere with plant seed or tuber production (i.e., waterfowl food) but would create large openings in wetland and turn under organic matter that would help support the growth of benthic invertebrate populations (Fredrickson and Reid 1986).

d. Areas planned for reforestation will further reduce the acres of habitat suitable for shorebirds. Few shorebirds use forested wetlands; thus, plans to replant or naturally recruit thousands of acres of flooded cropland will actually further reduce shorebird habitat. This fact was ignored in the DEIS.

e. Concentrating shorebirds onto just a few properties likely will generate more attention by predators, which will decrease the time available for foraging and shrink the functional size

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of mitigation habitats. Finally, increasing shorebird density will increase risk of disease transmission.

These problems with the shorebird mitigation are significant. Overall, they imply that mitigation for shorebird impacts would be modest at best. They individually and collectively preclude me from concluding that impacts on shorebirds are fully impacted, and their use of the project area is ecologically important.

The views expressed are to true and correct to the best of my knowledge, information, and belief. I make them subject to penalties for unsworn falsifications to authorities.

Regards,

Bruce Dugger, PhD
Associate Professor

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