Dear Ms. Griffiths,

Thank you for the opportunity to comment on the draft Concord River Diadromous Fish Restoration Feasibility Study and for the informative public presentation on the study in February.

OARS is the watershed organization for the Assabet, Sudbury, and Concord Rivers, their tributaries and watershed, founded in 1986. Our mission is to protect and restore the health of these rivers and to increase public awareness of the rivers’ value as important natural resources. OARS serves the over 400,000 residents of the 31-town watershed. OARS uses science-based advocacy, education and recreation to implement its mission with four program areas: Water Science; Stewardship; Policy Advocacy; and Community Outreach and Education. OARS is recognized for its well-respected water quality, biomass and streamflow monitoring, invasive aquatic species mapping and control, and river cleanup programs. Stewardship and recreation activities have focused on bringing people to the three rivers to experience their beauty and complexity and engage them in stewardship.

We were impressed by the thoroughness of the draft report and have found it very useful in evaluating the options. There is a tremendous amount of detail in the Technical Assessment section, which in general corroborates our own understanding, and we will restrict ourselves to comments on the Alternatives Analysis.

In general, OARS supports the restoration of the free flow in rivers, recognizing that in some cases there may be site-specific reasons to not remove dams. At Middlesex Falls, where the dam is breached it is not clear that channel modifications would improve diadromous fish passage. OARS supports the “no action” alternative and evaluation of fish migration at the Centennial Falls dam unless and until channel modifications are shown to improve fish passage and recreation.

Due to the existence of functioning hydropower facilities at Centennial Falls and installed fish passage, we support fishway improvements and volunteer coordination (2A and 2B) at Centennial Falls, with the following provisos: (1) The hydropower facility at Centennial Falls dam must be equipped with effective means of diverting and protecting eels that are migrating downstream, if they are not already in place. Hydroelectric turbines are notorious for killing these very long fish. Enabling upstream migration does not confer much benefit if the eels are not able to migrate downstream to spawn. Mortality of eels should be monitored. (2) The recommended enhancements at the Centennial Falls dam should be monitored to ensure that they in fact work well for both fish passage and local recreational use.
The option to create a simple fishway (Sec. 4.2.3) at Middlesex Falls, or a more natural fishway such as a bypass channel or rock ramp (Sec. 4.2.4) at Centennial Falls should be revisited if full passage of the target or other important species is not restored by the selected options.

In the case of the Talbot Mills dam, we strongly support the restoration of free flow through the partial dam removal option (3B). We would support the preservation of a dam abutment or a means of creating a falling water feature, if the owner so chooses, to provide a visual reminder of the dam’s important historical role. Option 3B provides the full benefit of unimpeded connectivity for aquatic life, particularly diadromous fish, major benefits in terms of nuisance invasive aquatic plant control, major benefits for recreational use of the river, and in our assessment is the most cost-effective approach to restoring the health of the river while meeting dam safety needs.

The benefits of partial dam removal at the Talbot Mills dam are numerous, as described below.

1. **Restoring continuity for aquatic life**: The importance of providing unimpeded passage for all aquatic life at this site cannot be overstated. This dam is the final block in the continuity of the SuAsCo river system to the ocean. As noted in the report, this river basin is one of the first Merrimack River tributaries that can provide extensive breeding habitats to diadromous fish. These fish play an important role in the northeast US coastal ecology and are just now staging a comeback due to heavy investment in habitat restoration. It is well documented that fish “ladders” are only effective for some species, and only pass a portion of the fish attempting to use them; an effective fish ladder also requires active management and upkeep. The fact that anadromous fish have been observed and counted in the Concord River downstream of the Talbot Mills dam is evidence that effective fish passage is now needed at the dam. It should be noted that dam removal also benefits other aquatic species by opening up continuity for more localized migration for breeding, foraging and finding refuge from predators and high temperatures. Current aquatic conditions in parts of the dam’s impoundment during the summer are very poor, with fish observed “piping” at the surface for air due to the lack of dissolved oxygen in the water under the cover of invasive water chestnut. Also note that, following the completion of upgrades to the wastewater treatment plants along the Assabet River (serving Westborough, Shrewsbury, Marlborough, Northborough, Hudson, and Maynard), water column phosphorus and dissolved oxygen concentrations in much of the Assabet River are significantly improved. The Assabet contributes approximately half of the flow of the Concord River. The towns of Concord and Billerica have similarly improved their wastewater discharges to the Concord River.

2. **Restoring continuity for recreational use**: Option 3B will significantly improve recreational use of the Concord River by eliminating the need for portages, creating an interesting rapids section, and eliminating obstruction by invasive water chestnut plants. This may increase public use of this site and afford more exposure to the significant industrial and Native American history located there. As noted above, there has been major public investment in improving the water quality which is increasing the recreational use of the river and the health of its wildlife.

3. **Reducing flooding**: Riverine floodplains are increasingly valuable as precipitations patterns are changing due to an increase in intensity of rain events and thus flooding under current climate predictions. A rule of thumb now is to consider the 500-year flood level to be the 1% (100-year) flood of the near future. While this study uses the 500-year flood delineation as the “high” flow level, in fact the high flows may be significantly higher. Since FEMA is barred from using precipitation projections in its flood flow calculations, the calculated flood delineations are by definition historical and will underestimate the extent of future flooding. Dam removal would significantly expand the available floodplains available between the Talbot Mills dam and the Fordway Bar upstream, and thus reduced the damaging effects of river flooding in that segment and, to some degree, upstream and downstream. The controlling role of the Fordway Bar in maintaining water elevations upstream means that there would be insignificant negative effects of dam removal on water levels upstream of the Fordway Bar.

4. **Invasive aquatic plant control**: The extensive water chestnut infestation of the impoundment created by the Talbot Mills dam needs to be addressed by the owners of the impoundment and its shoreline (see Figure 1).
This infestation, of about 4 acres, severely impacts the quality of aquatic habitat in the impoundment, resulting in very low water column dissolved oxygen under the vegetation which damages aquatic life, and near complete loss of sunlight penetration. During the summer the appearance of the impoundment, which contains the historic canal towpath feature, is significantly degraded by nearly total coverage of all water surfaces by this plant. This deviates far from its natural and historical appearance. In addition, navigation of the impoundment by boat is near impossible by August due to the plant growth which limits recreational use of the river. Further, the water chestnut population in the impoundment creates a seedbed which spreads the invasive plant downstream in the shallow areas along the length of the Concord River. It is considered futile to attempt to manage the spread of the water chestnut downstream if this source area is not eliminated. Partial dam removal, as suggested in Option 3B would virtually eliminate this problem by lowering the water level in the shallow impounded areas on the eastern side of the river and creating new wetland habitat there. Hand-pulling the remaining pockets of water chestnut plants along the shoreline could be done by volunteers. The alternative is mechanical or chemical (herbicide) control of water chestnut, which is expensive and difficult in this shallow impoundment which contains over 5-foot-deep sediment. Intensive management of 4-6 years would be required to bring the water chestnut population under control (the seeds can be viable for 12 years) with ongoing maintenance in perpetuity.

5. Historic and cultural preservation and interpretation. There have been many successful dam removal projects that have enhanced the public’s access to and enjoyment of historical sites. S sensitively designed river restoration projects can increase the visibility and opportunities for interpretation of the historic mills and waterfront areas, and encourage public exploration of the area by enhancing recreational use of the river. The proposed partial dam removal would open up possibilities for a canoe landing, trails, and historic interpretive panels, and expose features that have been hidden underwater to public view and research exploration.

In conclusion, OARS supports the “no action” alternative at Middlesex Falls, fishway improvements and volunteer coordination (2A and 2B) at Centennial Falls, and strongly supports the restoration of free flow through the partial dam removal option at the Talbot Mills Dam (3B) to provide the benefits of unimpeded connectivity for aquatic life, invasive aquatic plant control, recreational use of the river, and dam safety needs in the most cost-effective way possible. OARS’ monitoring program shows that water quality in the rivers has improved significantly with recent investments in control of wastewater pollutant discharge. However the challenge of the growing populations of invasive water chestnut on all three rivers, and the impacts of climate change on river flow and habitat quality, mean that efforts to restore and protect fish habitat need to be redoubled. The partial removal of the Talbot Mill dam, in particular, would bring significant wildlife, recreation and water quality improvements to this section of the Concord River while providing the opportunity to enhance appreciation of the site’s significant history. The different requirements of the only catadromous species in the study, the American eel, should be considered in all designs and monitoring.

We hope these comments are useful. Please don’t hesitate to contact us if you have any questions or we may be of assistance.

Yours sincerely,

Alison Field-Juma

Cc: Billerica Conservation Commission
    Jane Calvin, Lowell Parks & Conservation Trust
    Libby Herland, US Fish & Wildlife Service
    Sarah Bursky, National Park Service
    Middlesex Canal Association
    Middlesex Canal Commission
Figure 1: Water chestnut coverage, Concord River, North Billerica