

Diadromous Fish Restoration Priority List: Parameter Table

Parameter	Description	Value
Obstruction Number	Number of obstructions in river system of the proposed project.	per unit
Acreage	Of potential spawning/nursery habitat available.	0 - 15
Existing Population	Ranking of status of existing fish run.	0 - 10
Passage	Rank project by existing passage.	0 - 10
Stream Flow	Rank the status of stream flow to support life history stages	-10 - 0
Public Access	Rank the status of public access	0 - 5
Water Quality	Tiered approach depending on available data	-7 - 0
Water Conflict Use	Rank competing water uses.	-5 - 0
Project Feasibility	Rank factors that influence construction or implementation feasibility.	-5 - 0
Environmental Benefits	Rank factors that relate to improvements other than river herring	0 - 5
Existing Funding	Rank the availability of committed funds for project.	0 - 5
Local Support	Rank the interest and support of municipality and local NGOs.	0 - 5
Cost	Rank project by cost.	-5 - 0

Notes on Valuation

additive valuation per unit obstruction; -1 for passable obstruction and -2 for impassible  
 <5 = 0; 5<10 = 1-2; 10<30 = 3-4; 30<50 = 5-6; 50<100 = 7-8; 100<200 = 9-10; 200<300 = 11-12; 300<400 = 13-14; >400 = 15 points.  
 0 = absent; 10 = one of larger runs in coastal drainage area.  
 BPJ: 0 = no obstruction; 1-3 = minor obstruction; 4-6 = restricted passage; 7-9 = severe blockages; and 10 points for no possible passage  
 best professional judgement rank (BPJ)  
 BPJ: 0 = none.  
 0 = no identified impairments; negative values for increasing impairment to -5 to -7 for not supporting spawning or nursery habitat.  
 BPJ: 0 = none.  
 BPJ: 0 = no limits on feasibility.  
 BPJ: 0 = no funds; 5 = near full funding with and project administrative commitment.  
 BPJ: 0 = none.  
 BPJ: <\$10,000 = 0 to -1; \$10,000-<\$50,000 = -1 to -2; \$50,000-<\$100,000 = -2 to -3;  
 >\$100,000 - \$500,000 = -3 to -4; >\$500,000 = -4 to -5.

Update Notes

The original V1 list was prepared by DMF Diadromous Fish Project Leader, Ken Reback, in 2010, using the DMF Anadromous Fish Survey Technical Reports. This list was used also for the NRCS/Cape Cod Water Resources Restoration Plan to guide restoration planning in that region. No changes were made for V2 (2015), followed by several important changes were made to the valuation process for V3 in 2017. The notes from V3 (#1-7) and V4 (#8-11) are retained below for background purposes. No updates were made for V5.

1. See November 10, 2016 **DMF Restoration Priority List memo** for more detailed description of parameters.
2. **Obstruction Number:** change scoring to -1 for passable obstruction and -2 for impassible obstructions. Allow the use of judgment to waive negative value for first obstruction that has very good passage (ex. excellent weir/pool ladder or nature-like grade change).
3. **Acreage:** changed scoring to allow up to 15 points for larger spawning/nursery habitats.
4. **Stream Flow:** changed scoring to allow a stronger negative influence (up to -10 points) for streams with inadequate flow to support migratory/spawning and nursery habitats.
5. **Passage:** relate scoring to the documented impairments in river herring habitat assessments (when available) for the following conditions.
  1. Excess vertical rise or grade change.
  2. Excess water velocity at outlet.
  3. High turbulence or irregular flow.
  4. Low or no flow (via stream flow).
  5. Low or no flow (diversion /operational).
  6. Inadequate attraction flow for passage
  7. Shallow water depth for passage (<6").
  8. Sediment impacts
  9. Debris blocking passage.
  10. Beaver dam blocking passage.
  11. Vegetation blocking passage.
  12. Degraded passage structure.
6. **Water Quality:** Increase range of scores from 0 to -5 to 0 to -7 to allow the assignment of a -1 value for each finding of impairment for the 7 water quality variables measured during DMF diadromous fish spawning and nursery habitat assessments (QAPP, Technical Report #42). For locations where no assessments have been conducted scores will continue to be assigned based on BPJ and existing monitoring data.
7. **Attribute Information:** The MassDEP review of the DMF Restoration Priority List Memorandum and Priority List produced the recommendation to add specific details to the valuations of Passage, Water Use Conflict and Project Feasibility. The purpose would be to allow the user to readily see what conditions caused the scoring. The design of the existing Excel spreadsheet does not readily allow the linking of Valuation Parameter scores to information on the scores. This is a limitation of the spreadsheet that DMF may correct with future versions. For now, users can contact DMF with questions on specific locations and scoring.

8. **Project Status:** Starting with V-3, projects that had restoration efforts that corrected the fish passage condition described in V-1 or V-2 were listed as *Completed* and separated from the other potential projects and removed from the regional ranking. This was done because the future status of completed projects could change as maintenance, rehabilitation or the naturalization of structures could become options as site conditions change. This approach was changed for V-4 to include Completed project in the list; however, only listing valuations for Passage and Population (requested by MassDEP for their watershed assessments) and the score and rank at the time of completion.
9. **Main Stem Acreage:** This region has several larger rivers (Ipswich/Merrimack/Charles/Neponset, ect.) where estimates for habitat acreage are subjective and not easily applied. The habitat acreage parameter was based on ponds/lakes. A better metric may be developed in the future for main stem rivers.
10. **Project Type:** The Attribute *Project Type* could be a short-term objective such as fishway maintenance or a long-term objective such as dam removal. This dichotomy in the selection of *Project Type* can be unclear to users. The Restoration List tends to favor short-term efforts to improve or maintain fish passage and will list long-term project types when appropriate given site characteristics or ongoing efforts.
11. **Elevated Scores:** Spawning/Nursery acreage is the highest possible valuation (15 max.) and can result in very high score in large water bodies that do not have a significant project pending. This occurs mainly with fishways that are suitable and only need maintenance. This is an ongoing concern that DMF staff should recognize but other users might be confused by high scores with no obvious project. The project type for many of these will be *Fishway Maintenance* or *Stream Maintenance*.

## Diadromous Fish Restoration Priority List

### Attribute Categories

Region	Watershed	Species	Location Status	Project Type	Project Status	Project Scope
1 = TR-18	Merrimack River	alewife	channel limitation	fish ladder	conceptual	external partners
2 = TR-17	Parker River	blueback herring	culvert limitation	channel improvement	planning	internal (DMF)
3 = TR-16	Ipswich River	American shad	existing fishway	fishway improvement	construction	private
4 = TR-15	North Coastal	rainbow smelt	degraded habitat	passage improvement	completed	
	Boston Harbor	American eel	no present passage	culvert improvement	dormant	
	South Coastal	white perch	passage limitation	fishway maintenance	maintenance	
	Cape Cod	lamprey	water diversion	stream maintenance		
	Islands		sedimentation	barrier beach		
	Buzzards Bay		no passage limitation	dam breach		
	Narragansett Bay		dam removed	dam removal		
	Taunton River			water management		
				operational		
				eel pass		
				smelt spawning riffle		
				tidegate		
				channel daylighting		
				fish lift		
				beaver dam		
				none proposed		

### Water Quality Variables

Variable	Period	Suitable Criteria
Water Temperature (spawning)	May and June	≤ 28.3 °C
Water Temperature (nursery)	July - September	≤ 26.0 °C
pH	May - September	≥ 6.5 to ≤ 8.3
DO	May - September	≥ 5.0 mg/L
Water Column Anoxia	July and August	≤ 50%
Secchi Disc Depth	May - September	≤ 2.0 m
Total Nitrogen	May - September	≤ 0.32 mg/L
Total Phosphorus	May - September	≤ 8.0 µg/L