

## River Herring - Overlapping Subgroup Issues

		Genetics	Habitat	Fisheries	Stock Status	Species Interactions	Climate
Connectivity	investigate migration patterns and ocean distribution	✓	✓	✓	✓	✓	✓
	impacts of various flows on passage		✓				✓
	assess fish just above the tide zone and below a structure		✓		✓		✓
	quantify juvenile emigration		✓		✓		✓
	distribution of fish in rivers, estuaries and at sea		✓	✓	✓	✓	
Data	compile/create database with sources & availability of archival samples	✓	✓	✓	✓	✓	✓
	consideration of Canadian data	✓	✓	✓	✓	✓	✓
	overcome barriers to merge datasets and ensure coordination across states to fill-in data gaps	✓	✓	✓	✓	✓	✓
	improve long term indices on population status			✓	✓	✓	✓
	standardize methods to count river herring		✓		✓		✓
	use microsatellites to determine effective population size - census population size	✓			✓		
	increase monitoring at range edges	✓			✓		✓
	monitor genetic diversity at different life history stages	✓			✓		
	consider historical trends of river herring, as well as fisheries moratorium & river herring bycatch avoidance programs				✓	✓	✓
	life history (ocean, habitat, etc.) for all stages and habitat areas (e.g., lake, river, estuary and ocean) using consistent coastwide protocols		✓	✓	✓	✓	✓
	increased river monitoring, not just at the first dam and of restocking		✓		✓		✓
	well-coordinated fishery independent survey network in juvenile habitats		✓	✓	✓		✓

April 11, 2016 (Recent additions highlighted where applicable)

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	data disparity for blueback herring versus alewives	✓	✓	✓	✓	✓	✓
	obtain juvenile indices		✓		✓		✓
	time varying mortality (M)				✓	✓	✓
	consider how the phenology changes with timing of the survey is important	✓	✓	✓	✓	✓	✓
	investigate mortality associated with energy production (i.e. power plants, wave energy, etc.)	✓	✓	✓	✓		
Funding	funding needed for river herring needs; explore non-traditional opportunities & increased collaboration	✓	✓	✓	✓	✓	✓
Habitats	quantitative larval assessment for habitats (e.g., for spawning areas in North Carolina other than the Albemarle Sound)		✓		✓		✓
	effects of legacy contaminants		✓				✓
	obtain habitat information on river herring using stable isotopes	✓	✓				✓
	estimates of spawning habitat by watershed (with and without dams)		✓		✓		✓
	climate change influences key habitat characteristics at all life stages.		✓				✓
	sea level rise on eastern shore of Maryland and Virginia could lead substantial loss to non-tidal habitat						✓
	current impacts such as water withdrawals may worsen with climate change						✓
	link freshwater habitat productivity and ocean mortality				✓		
	develop and implement monitoring protocols and analyses to determine river herring population responses and targets for rivers undergoing restoration		✓				

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Policy	determine ecosystem based management goals	✓	✓	✓	✓	✓	✓
Population Structure	investigate impacts of hybridization between river herring species	✓	✓		✓	✓	✓
	rangewide perspective important for subgroups; additional expertise inside and outside the TEWG may be needed	✓	✓	✓	✓	✓	✓
	coordinate on otolith microchemistry research	✓	✓		✓		
Fishing	mixed stock analysis in ocean to id stocks from which bycatch is occurring; need genetics to link catch to stocks	✓		✓	✓		✓
	evaluate mortality on transboundary stocks in order to add a Canadian mortality component	✓		✓	✓		
	relative impact of predation and bycatch on river herring populations			✓	✓	✓	
Predation	determine impacts of invasive species on habitat quality and predation		✓			✓	
	use genetics to identify predation effects	✓				✓	
	assimilate predation data into modelling efforts		✓		✓	✓	✓
Reproduction	reproduction		✓	✓	✓	✓	✓
	stock recruitment		✓	✓	✓		✓

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