Joint Pilot Assessment of Fish Habitat in both Nontidal and Tidal Waters of the Chesapeake Bay

FISH HABITAT ACTION TEAM MEETING - FALL 2021

NOAA NCCOS
NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

USGS science for a changing world

NOAA CHESAPEAKE BAY

Presentation topics:

- Review assessment milestones
- Review the selection criteria and the factors included in the Matrix
- Present the top results and describe considerations
- Present final decision and discuss next steps

Purpose:

Present the criteria and decision matrix results used by NOAA and USGS to identify river system options for a joint pilot with nontidal and tidal habitats.

MILESTONES 2020-2021 Logic & Action Plan

2.1 Evaluation of different scales and summary assessment methods in a test area (nontidal only)

2 .2 Evaluation of information at 1:100K for non-tidal portion of the watershed, and compare with existing NFHP assessment.

2.3 Build analytical framework for candidate tidal tributary using physical and biological datasets. Review the analytical and statistical framework with regional experts.

2.4 Develop recommendations for extending the tidal analytical /statistical framework from candidate tributary to Chesapeake Bay tidal areas.

2.5 Summary of fish metadata and data gaps specific to biological fish data.

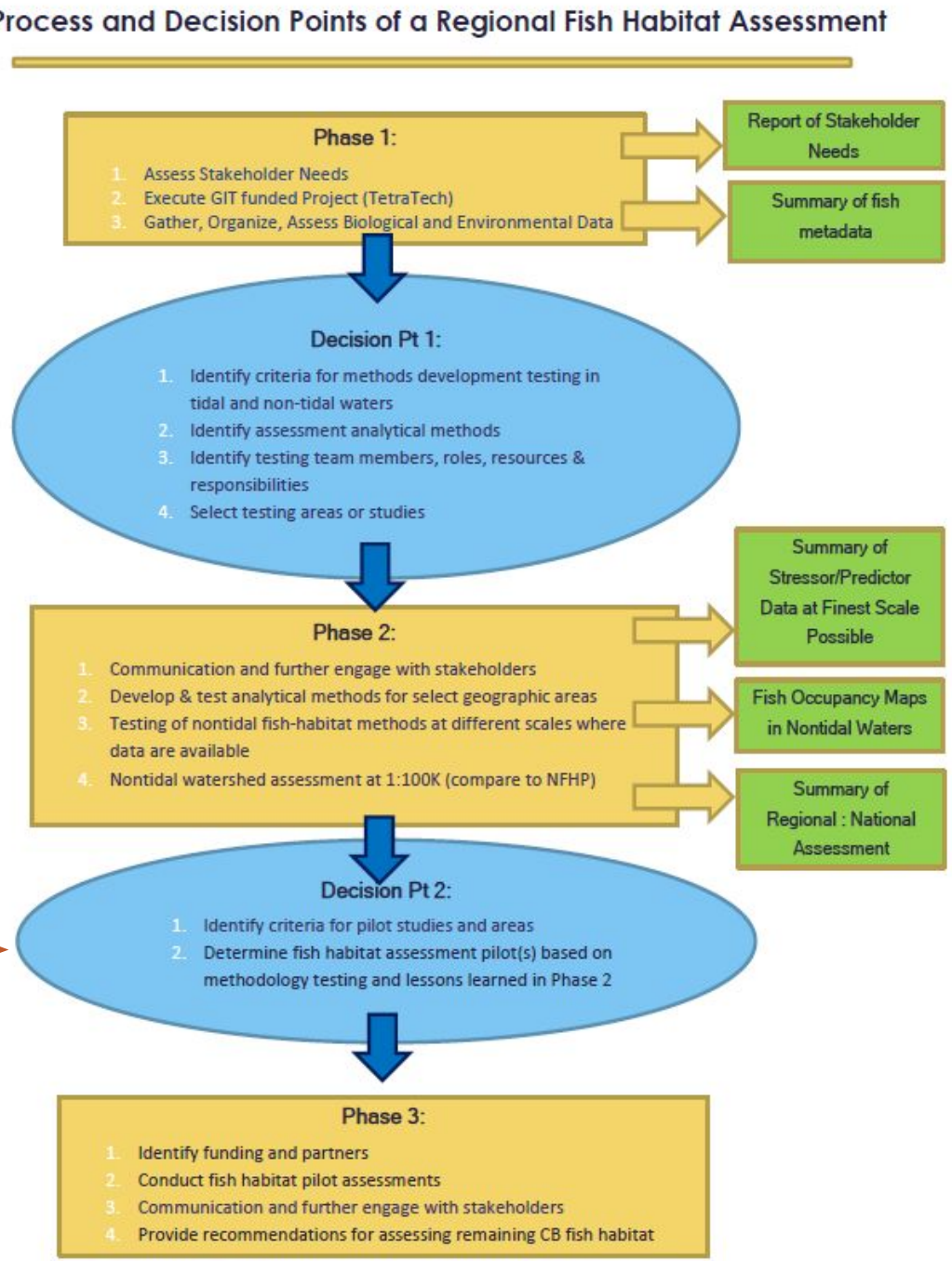
2.6 Updated inventory of stressors and predictors, their spatial scale and identification of data gaps (nontidal and tidal)

2.7 Build on non-tidal and tidal analytical and assessment work to identify options for joint NOAA-USGS pilot with non-tidal and tidal habitats.

We are here

3.1 Species Occupancy maps (Nontidal only)

4.1 Produce report on stakeholder needs -includes NOAAs white paper (tidal) and USGS summary of meetings (nontidal)



Development of Decision Matrix

The objective of the matrix is to characterize data available and attributes of river systems in order to compare rivers for suitability as location for a joint assessment.

The team modified a decision matrix previously developed by USGS to select nontidal test areas. Some fields were removed and others added to account for tidal portions of the river systems.

The team assessed 10 river systems, all having 3 or 4 habitat types.

Common factors assessed for both nontidal and tidal: habitat types, watershed size, fish data spatial coverage, fish data access, and fish data age.

Criteria

The team considered a number of factors in adding river systems to the decision matrix, and identifying options for the joint pilot area:

- Preference for river systems with all four habitat types.
  - Some smaller systems were merged to include more habitat types.
  - Western shore rivers are more prevalent in matrix as they have cold headwater habitat.
- Consideration of known fish data availability, quality, and consistency.
- Preference for river systems governed by fewer fishery management jurisdictions.
- Given that this is a pilot project, a known stakeholder champion or stakeholder need is important but must be matched to habitat types and data considerations.

Matrix Factors

Blue highlighted factors relate to preferences of habitat types, geographic size and jurisdictions

Green and Yellow highlighted factors are part of the semi-quantitative score for fish data in each river system

General

- HUC8 Names
- HUC8 Codes
- Total Area
- State
- Habitat Types (cold headwater, large-nontidal river, tidal freshwater, tidal estuarine)
- Fishery Management Jurisdiction(s)
- Known Specific Audience/Stakeholder (excluding state agencies)
- Audience or Stakeholder Need

Nontidal

- Nontidal Network Stations
- Availability of Landscape-level predictors of Fish Habitat
- Quality of Landscape-level predictors of Fish Habitat
- Consistency of Landscape-level predictors of Fish Habitat
- Nontidal Fish Community Data Spatial Coverage
- Nontidal Fish Data Access
- Nontidal Fish Data Age
- Mean Nontidal Fish Data Criteria Score
- Total Fish Samples
- Fish Community Data Samples
- Potential Nontidal Species of Focus

Tidal

- Tidal Water Fish Data Spatial Coverage
- Tidal Water Fish Data Access
- Tidal Water Fish Data Age
- Mean Tidal Fish Criteria Score
- Total Tidal Fish Samples
- Principal Tidal Water Surveys
- CBP WQ Monitoring Stations
- Potential Tidal Species of Focus

Decision Matrix

Matrix Layout:

- River systems in rows and factors in columns

River Systems Considered:

- Those included in original USGS matrix and others that may contain all 4 habitat types

Primary Factors:

- Preference for all 4 habitats in the same river system
- Preference for smaller size/complexity of system, indicated by:
  - Number of HUCs
  - Area (SqKm)
  - Number of Jurisdictions

River System	HUC8 Codes	Total Area (SqKm)	Habitat Types (cold headwater, large-nontidal rivers, tidal fresh, tidal estuarine)	Fishery Management Jurisdiction(s)
Patuxent	2060006	2,401	4	MDDNR
Rappahannock	02080103, 02080104	7,026	4	VMRC, VDWR
James	02080201, 02080202, 02080203, 02080204, 02080205, 02080206, 02080207, 02080208	26,789	4	VMRC, VDWR
Potomac	02070001, 02070002, 02070003, 02070004, 02070005, 02070006, 02070007, 02070008, 02070009, 02070010, 02070011	38,018	4	PAFBC, WVDNR, MDDNR, VDWR
Susquehanna	all (19) 0205xxxx HUC8s	71,224	3	PAFBC, MDDNR
York	02080107, 02080105, 02080106	6,928	3	VMRC, VDWR
Chester	2060002	3,374	3	MDDNR
Choptank	2060005	2,844	3	MDDNR
Sassafras	2060002	3,374	3	MDDNR
Severn	2060004	955	3	MDDNR

Decision Matrix

Fish Data Criteria Scores:

- Semi-quantitative:
  - Spatial coverage
  - Data access
  - Data age
- Mean score for nontidal and tidal, separately
- Combined score

- Notes:
  - There is good data access for all nontidal waters, but not for all tidal waters
  - Susquehanna scores marked "NA" because of dam and relatively small tidal portion

	Nontidal Fish Data Factors				Tidal Fish Data Factors				
River System	Spatial Coverage [1(sparse data or strong spatial clustering), 3(good coverage but dominated by presence/absence data), 5(good spatial coverage and primarily abundance data)]	Data Access [1-most data held by survey program, 2-mix of availability, 3-most data readily avail]	Data Age [1-most data old (before 2010), 2-substantial data post 2010]	Mean Criteria Score (average of columns L, M, and N)	Spatial Coverage [1(sparse data or strong spatial clustering), 3 (good coverage but dominated by presence/absence data), 5(good spatial coverage and primarily abundance data)]	Data Access [1-most data held by survey program, 2-mix of availability, 3-most data readily avail]	Data Age [1-most data old (before 2010), 2-substantial data post 2010]	Mean Criteria Score (average of columns S, T, and U)	Combined Nontidal and Tidal Fish Data Mean Criteria Scores
Patuxent	4	3	2	3.0	5	3	1	3.0	6.0
Rappahannock	5	3	1	3.0	5	1	2	2.7	5.7
James	5	3	1	3.0	5	1	2	2.7	5.7
Potomac	3	3	2	2.7	1	3	2	2.0	4.7
Susquehanna	3	3	2	2.7	NA	NA	NA	NA	Nontidal Score only
York	5	3	1	3.0	5	1	2	2.7	5.7
Chester	3	3	2	2.7	3	2	1	2.0	4.7
Choptank	3	3	2	2.7	3	2	1	2.0	4.7
Sassafras	3	3	2	2.7	5	2	1	2.7	5.3
Severn	1	3	2	2.0	1	2	1	1.3	3.3

River System Groups Based on Criteria

RIVER SYSTEMS WITH ALL 4 HABITATS AND 1- 2 FISHERY MANAGEMENT JURISDICTIONS

- Patuxent
- Rappahannock
- James

RIVER SYSTEMS WITH 3 HABITATS AND 1- 2 FISHERY MANAGEMENT JURISDICTIONS

- York
- Chester
- Choptank
- Sassafras
- Severn

RIVER SYSTEM WITH ALL 4 HABITATS AND MULTIPLE JURISDICTIONS

- Potomac - large and complex with several jurisdictions

RIVER SYSTEM WITH 3 HABITATS AND MULTIPLE JURISDICTIONS

- Susquehanna - very large headwaters and very small tidal portion

Leading Options in Descending Order

RIVER SYSTEMS WITH ALL 4 HABITATS AND 1 - 2 FISHERY MANAGEMENT JURISDICTION

- Patuxent-
  - Has cold headwaters, but very little brook trout occupancy.
  - Sample level tidal and nontidal fish data publicly available.
  - Tractable size.
- Rappahannock-
  - Other USGS EcoDrought/brook trout studies in headwaters (Shenandoah NP).
  - Only have aggregated tidal fish data. Would seek to collaborate with VIMS.
  - Tractable size.
- James-
  - Has cold headwaters, many EBTJV brook trout patches, Shenandoah NP headwater study catchments.
  - Only have aggregated tidal fish data. Would seek to collaborate with VIMS.
  - Much larger in size relative to other two.

Next Steps

- Coordinate with new FHAT Coordinator to Include Project in 2022-2023 Logic and Action Plan - FY22 Q1
- Complete Joint Pilot Work Plan - FY22 Q1
- Conduct Literature Review - FY22 Q1
- Compile Existing Data - FY22 Q1/Q2
- Engage With Relevant Patuxent River Stakeholders - FY22 Q3