The Nature Conservancy
Protecting nature. Preserving life.™

Northeast Aquatic Connectivity

GLOSSARY & METRIC DESCRIPTIONS

This glossary was developed to support the interpretation of
the North Atlantic Aquatic Connectivity Collaborative's Northeast Aquatic Connectivity web map & tool

Tiered Results (5% bins)

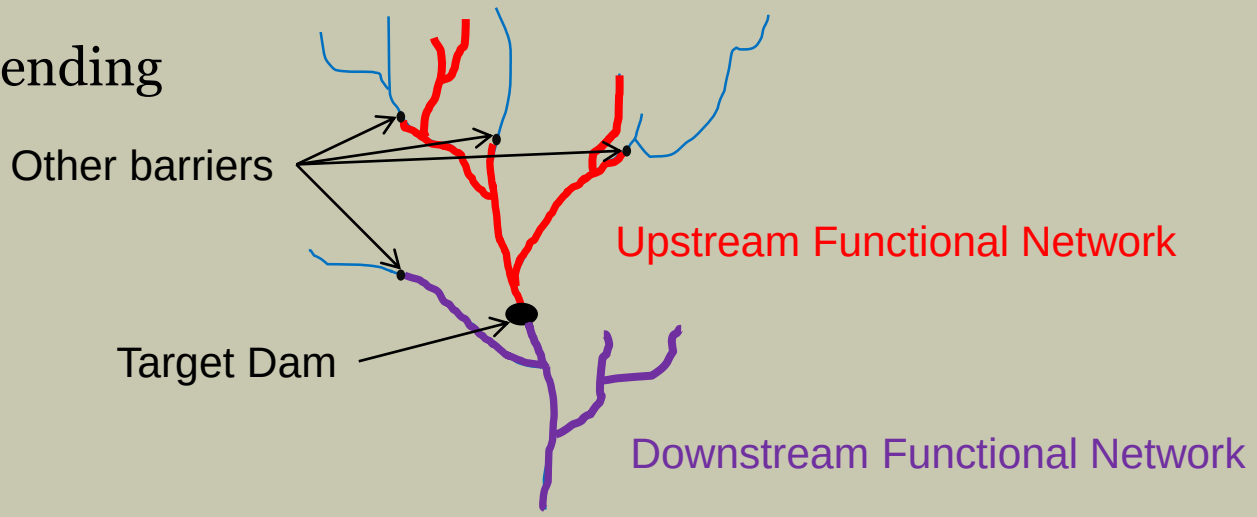
- Analysis results grouped into 20 bins where each bin has 5% of the barriers in the analysis area.
- These are the results that should be used for barrier assessments

Sequential Rank

- The sequential list of barriers produced by the analysis.
- This list should be used with extreme caution: the precision with which GIS can calculate metrics and rank barriers is not necessarily indicative of ecological differences
- The Tiered Results (5% bins) should be used to assess barriers for their potential ecological benefit

Upstream Functional Network Length

- Category: Network
- Length of the functional network upstream of a barrier. The functional network is defined by those sections of river that a fish could theoretically access from any other point within that functional network. Its terminal ends are barriers, headwaters, and/or the river mouth.
- Unit: meters
- Sort Order: Descending

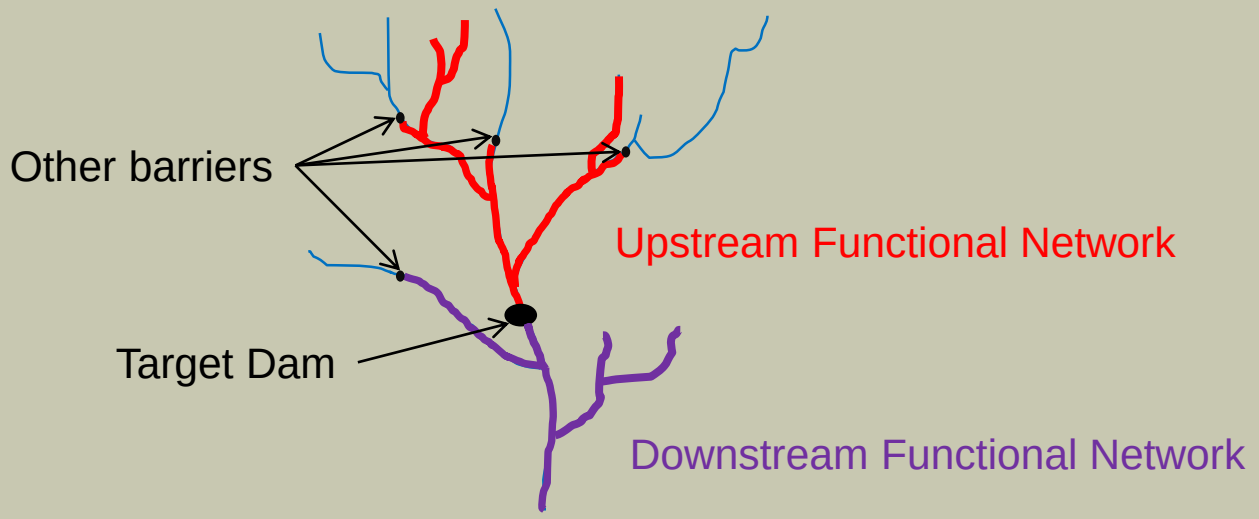


Downstream Functional Network Length

- Category: Connectivity Improvement

- Length of the functional network downstream of a barrier. The functional network is defined by those sections of river that a fish could theoretically access from any other point within that functional network. Its terminal ends are barriers, headwaters, and/or the river mouth.

- Unit: meters



Downstream Barrier Count

- Category: Network
- The number of barriers downstream of a given barrier
- Includes natural waterfalls, which are included in network generation
- Does not include barriers excluded from network generation
- Unit: #
- Sort Order: Ascending

Downstream Natural Barrier Count

- Category: Network
- The number of natural barriers (e.g. waterfalls) downstream of a given barrier
- Unit: #
- Sort Order: Ascending

Downstream Hydropower Facility Count

- Category: Network
- The number of hydropower facilities downstream of a given barrier.
- Includes all dams which include hydropower as one of the listed dam purpose in the source dam data
- Unit: #
- Sort Order: Ascending

Product of all downstream barrier passability scores

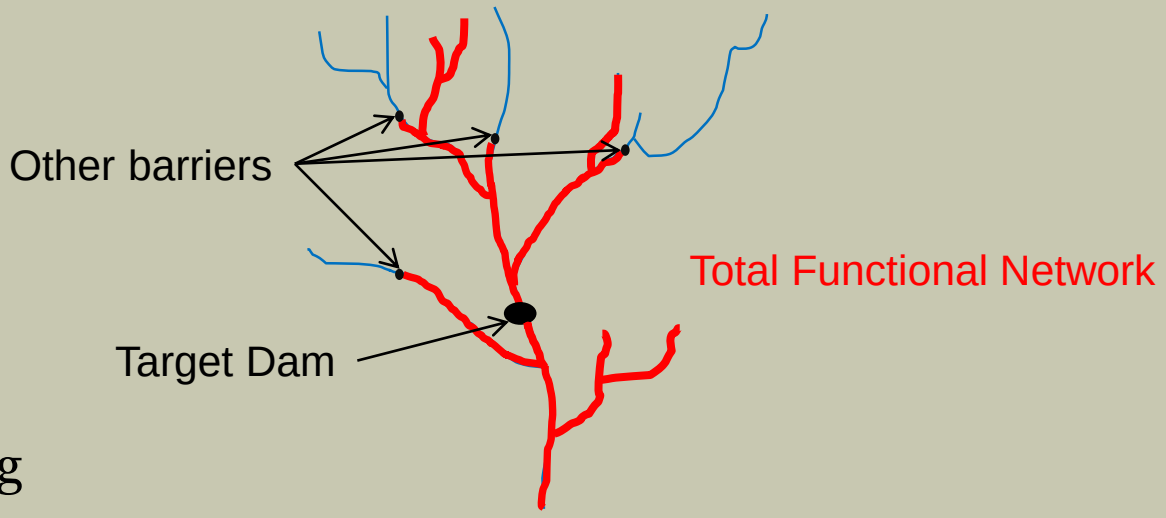
- Category: Network
- Each barrier is assigned a passability score from 0 (no passage) to 1 (full passage). Dams are assigned a score of 0. Crossings which have been surveyed are assigned a score based on the NAACC's numeric scoring system. Crossings which have not been surveyed are assigned an estimated score as part of the UMass Critical Linkages project.
- This metric is the product of the passability scores of all downstream barriers. It is a measure of the difficulty an aquatic species would have to reach the base of the barrier in question.
- Unit: unitless score
- Sort Order: Descending

Absolute Gain

- Category: Network
- This metric is the minimum of the two functional networks of a barrier. For example if the upstream functional network was 10 kilometers and downstream functional network was 5 kilometers, then the Absolute Gain will be 5 kilometers.
- Unit: meters
- Sort Order: Descending

Total Functional Network Length

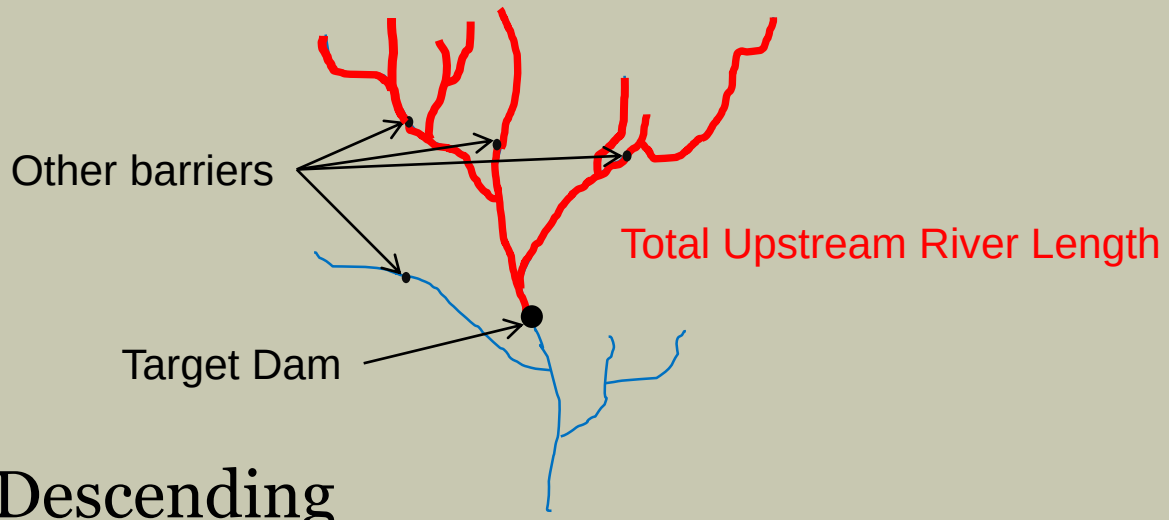
- Category: Connectivity Improvement
- Summed length of the upstream and downstream functional networks of a barrier. The functional network is defined by those sections of river that a fish could theoretically access from any other point within that functional network. Its terminal ends are barriers, headwaters, and/or the river mouth.



- Unit: meters
- Sort Order: Descending

Total Upstream River Length

- Category: Network
- Total length of river network upstream of a given barrier, regardless of any upstream barriers.
- Unit: meters



- Sort Order: Descending

% Forested LC in Contributing Watershed

- Category: Watershed & Local Condition
- % forested landcover in entire upstream watershed. Calculated 2011 National Land Cover Database.
- Forested landcover aggregated from the following classes: deciduous forest, evergreen forest, mixed forest
- Unit: %
- Sort Order: Descending

% Natural LC in Contributing Watershed

- Category: Watershed & Local Condition
- % natural landcover in entire upstream watershed. Calculated 2011 National Land Cover Database.
- Natural landcover aggregated from the following classes: open water, barren land, deciduous forest, evergreen forest, mixed forest, scrub/shrub, grassland/herbaceous, woody wetlands, emergent wetlands
- Unit: %
- Sort Order: Descending

% Agricultural LC in Contributing Watershed

- Category: Watershed & Local Condition
- % agricultural landcover in entire upstream watershed. Calculated 2011 National Land Cover Database.
- Forested landcover aggregated from the following classes: cultivate crops, pasture/hay
- Unit: %
- Sort Order: Ascending

% Impervious Surface in Contributing Watershed

- Category: Watershed & Local Condition
- % Impervious surface in entire upstream (contributing) watershed. Calculated 2011 National Landcover Database percent developed imperviousness.
- Unit: %
- Sort Order: Ascending

% Forested in ARA of Upstream Functional Network

- Category: Watershed & Local Condition
- % forested landcover within Active River Area of the upstream functional river network.
- National Landcover Database 2011 data. Includes the following classes: deciduous, evergreen & mixed forest
- Unit: %
- Sort Order: Descending

% Forested in ARA of Downstream Functional Network

- Category: Watershed & Local Condition
- % forested landcover within Active River Area of the downstream functional river network.
- National Landcover Database 2011 data. Includes the following classes: deciduous, evergreen & mixed forest
- Unit: %
- Sort Order: Descending

% Natural LC in ARA of Upstream Functional Network

- Category: Watershed & Local Condition
- % natural landcover within Active River Area of the upstream functional river network.
- National Landcover Database 2011 data. Includes the following classes: open water, barren land, deciduous forest, evergreen forest, mixed forest, scrub/shrub, grassland/herbaceous, woody wetlands, emergent wetlands
- Unit: %
- Sort Order: Descending

% Natural LC in ARA of Downstream Functional Network

- Category: Watershed & Local Condition
- % natural landcover within Active River Area of the downstream functional river network.
- National Landcover Database 2011 data. Includes the following classes: open water, barren land, deciduous forest, evergreen forest, mixed forest, scrub/shrub, grassland/herbaceous, woody wetlands, emergent wetlands
- Unit: %
- Sort Order: Descending

% Agricultural LC in ARA of Upstream Functional Network

- Category: Watershed & Local Condition
- % agricultural landcover within Active River Area of the upstream functional river network.
- National Landcover Database 2011 data. Includes the following classes: cultivated crops, pasture/hay
- Unit: %
- Sort Order: Ascending

% Agricultural LC in ARA of Downstream Functional Network

- Category: Watershed & Local Condition
- % agricultural landcover within Active River Area of the downstream functional river network.
- National Landcover Database 2011 data. Includes the following classes: cultivated crops, pasture/hay
- Unit: %
- Sort Order: Ascending

% Impervious Surface in ARA of Upstream Functional Network

- Category: Watershed & Local Condition
- % impervious landcover within Active River Area of the upstream functional river network.
- National Landcover Database 2011 data
- Unit: %
- Sort Order: Ascending

% Impervious Surface in ARA of Downstream Functional Network

- Category: Watershed & Local Condition
- % impervious landcover within Active River Area of the downstream functional river network.
- National Landcover Database 2011 data
- Unit: %
- Sort Order: Ascending

Dam is located on Conservation Land

- Category: Watershed & Local Condition
- Dam is located on conservation land
- Based on TNC's 2014 Eastern Division secured areas database
- Includes conserved lands in GAP Status 1, 2, & 3 that do not have parcel-level restrictions on data distribution
- Unit: Boolean

NFHP Risk of Degradation Score

- Category - Watershed & Local Condition

- Relative risk of habitat degradation based on the mapped level of disturbance to fish habitats
- Based on National Fish Habitat Partnership data
- Scores are passed to each barrier from the NHD Plus catchment it is located within, where:
  - 1.0 – 1.5 = Very High Relative Risk of Habitat Degradation
  - 1.6 – 2.5 = High Relative Risk of Habitat Degradation
  - 2.6 – 3.4 =Moderate Relative Risk of Habitat Degradation
  - 3.5 – 4.2 = Low Relative Risk of Habitat Degradation
  - 4.3 – 5.0 = Very Low Relative Risk of Habitat Degradation

- Barriers located in catchments that were not scored (No Data) are given a Moderate value to minimize the impact of the lack of data on the relative barrier prioritization

Presence of 1 or more Anadromous Species in Downstream Network

- Category: Ecological - Anadromous
- Presence of habitat for 1 or more of the 7 anadromous species included in this analysis based on the data and methods described for each species:
  - alewife, blueback herring, American shad, hickory shad, striped bass, Atlantic sturgeon, Atlantic salmon
- Habitat for each species is coded as “Current”, “Historical”, or “None Documented”
- If current and historical habitat are documented in the downstream functional network for different species, the current habitat trumps the historical habitat. So if alewife habitat is “Current”, American shad habitat is “Historical” this metric will be “Current”, indicating that habitat for 1 or more anadromous species is currently documented in the dams downstream network (based on the methods described for each species).
- Unit: presence / absence
- Sort Order: Asending

Number of Anadromous Species

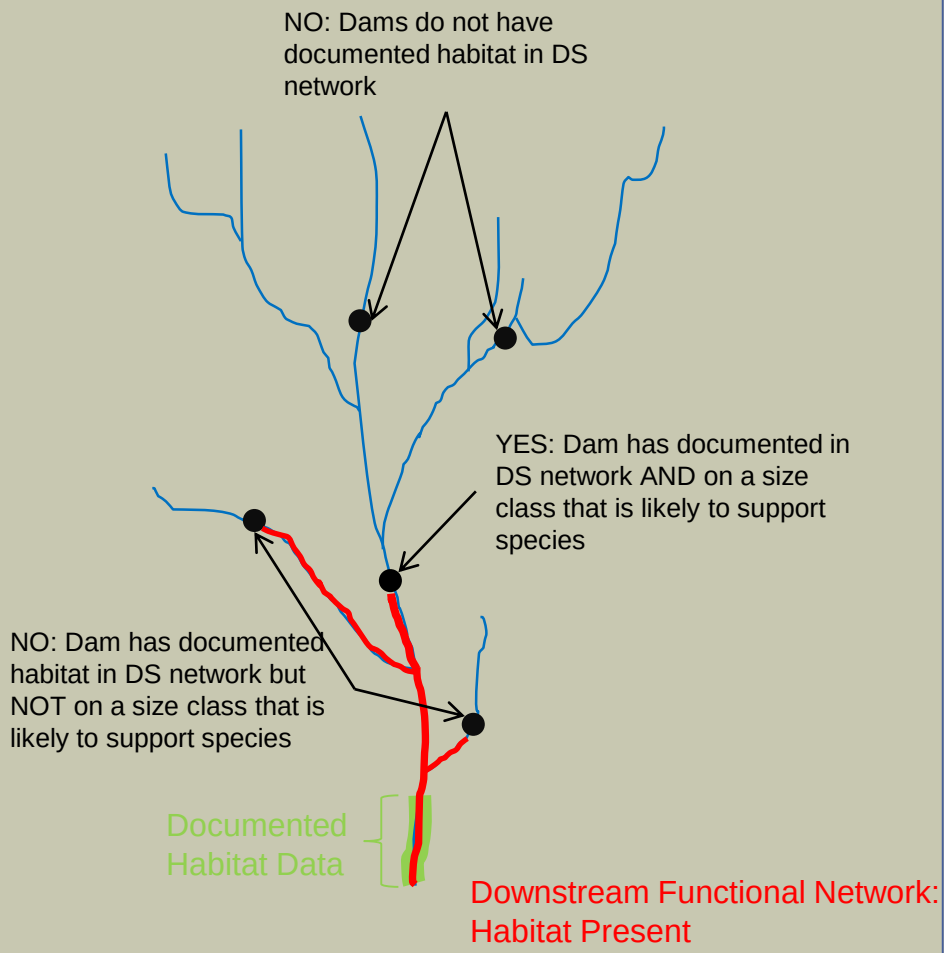
- Category: Ecological - Anadromous

- The number of anadromous species with documented *current* habitat in the downstream functional network of each dam based on the data and methods described for each species:
  - alewife, blueback herring, American shad, hickory shad, striped bass, shortnose sturgeon, Atlantic sturgeon, Atlantic salmon

- Unit: #
- Sort Order: Descending

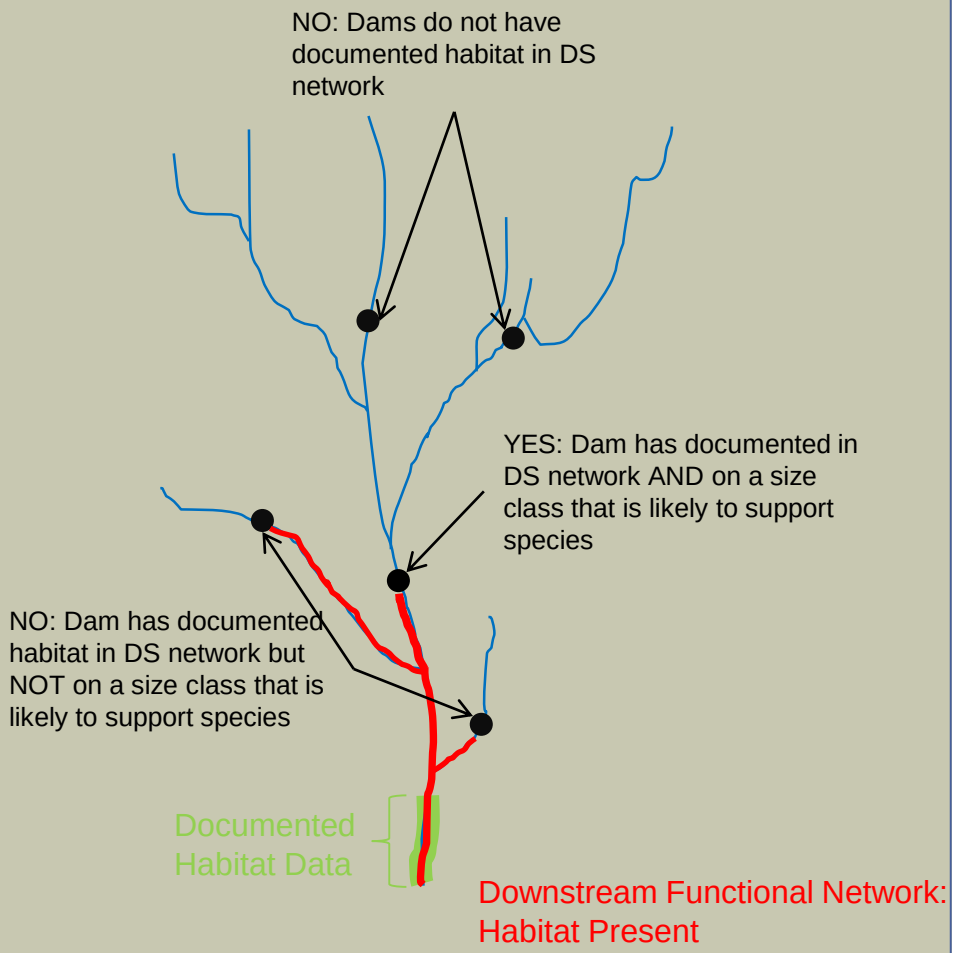
Alewife habitat in Downstream Functional Network

- Category: Ecological
- Presence of alewife downstream of dam. Based on:
  1. Documented habitat in some portion of the dam's downstream functional network
  2. **AND** Dam is on a stream that is likely to support that species based on stream size
     1. Size 1a+
- Fish habitat data from multiple sources. See the Map Layer descriptions for more details.
- Unit: Unitless Classes: "Current", "Historical", "None Documented"



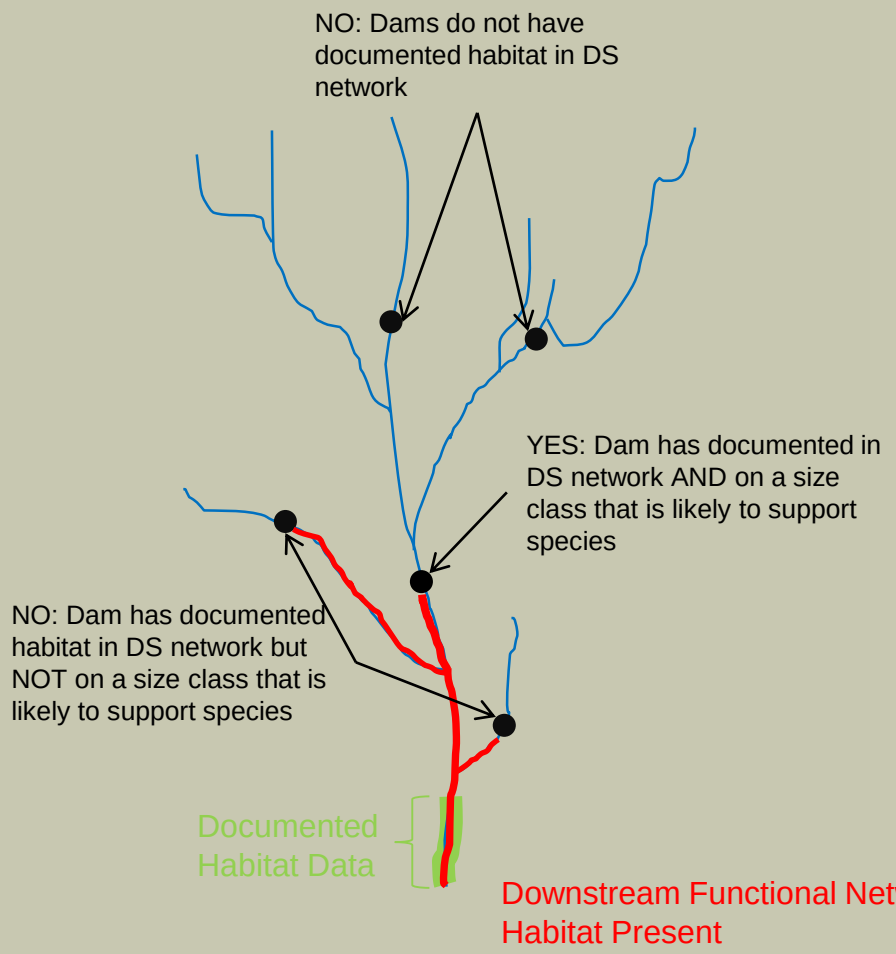
Blueback Herring habitat in Downstream Functional Network

- Category: Ecological
- Presence of blueback herring downstream of dam. Based on:
  1. Documented habitat in some portion of the dam's downstream functional network
  2. **AND** Dam is on a stream that is likely to support that species based on stream size
     1. Size 1a +
- Fish habitat data from multiple sources. See the Map Layer descriptions for more details.
- Unit: Unitless Classes: "Current", "Historical", "None Documented"



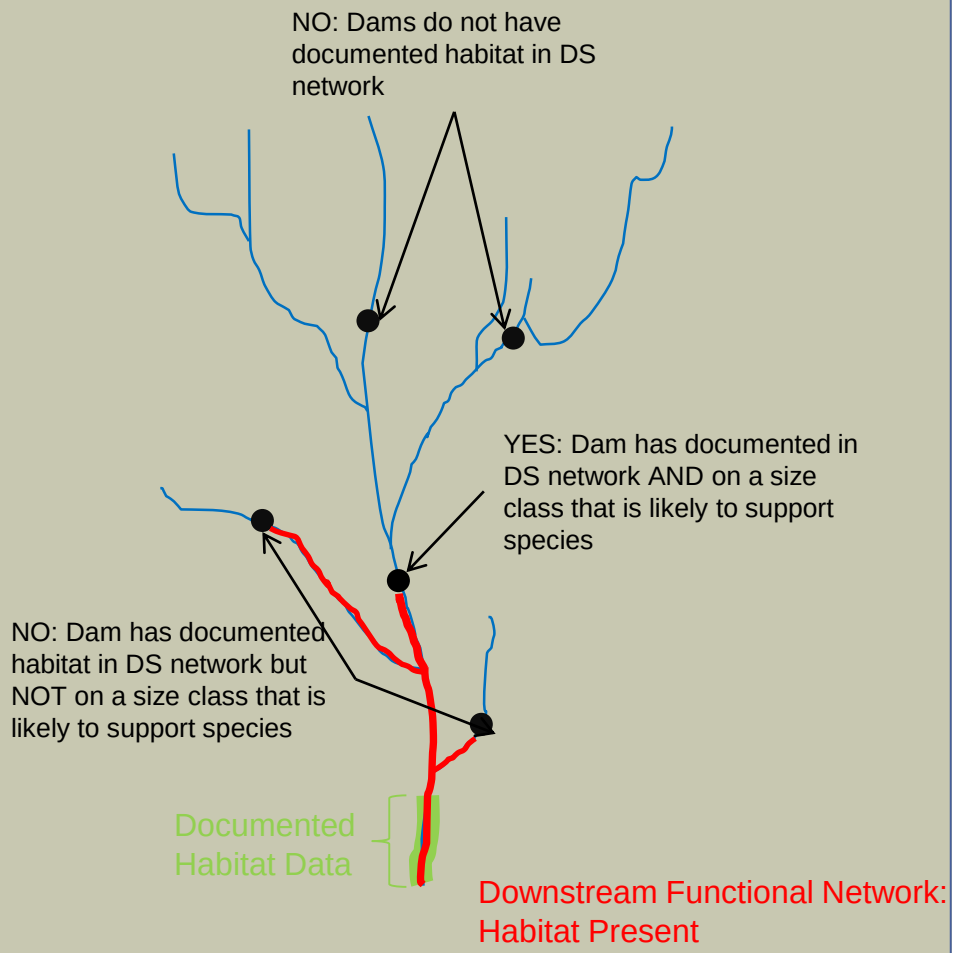
American Shad habitat in Downstream Functional Network

- Category: Ecological
- Presence of American shad downstream of dam. Based on:
  1. Documented habitat in some portion of the dam's downstream functional network
  2. **AND** Dam is on a stream that is likely to support that species based on stream size
     1. Size 2+ Rivers
- Fish habitat data from multiple sources. See the Map Layer descriptions for more details.
- Unit: Unitless Classes: "Current", "Historical", "None Documented"
-



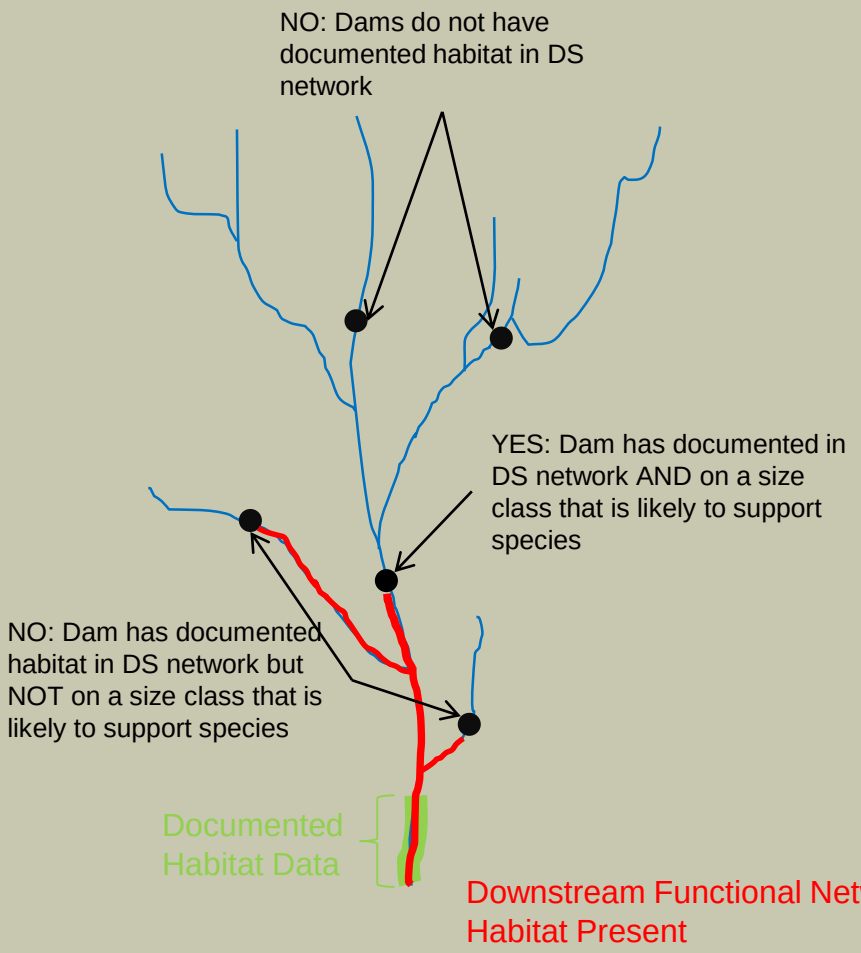
Hickory Shad habitat in Downstream Functional Network

- Category: Ecological
- Presence of Hickory shad downstream of dam. Based on:
  1. Documented habitat in some portion of the dam's downstream functional network
  2. **AND** Dam is on a stream that is likely to support that species based on stream size
     1. Size 2+ Rivers
- Fish habitat data from multiple sources. See the Map Layer descriptions for more details.
- Unit: Unitless Classes: "Current", "Historical", "None Documented"



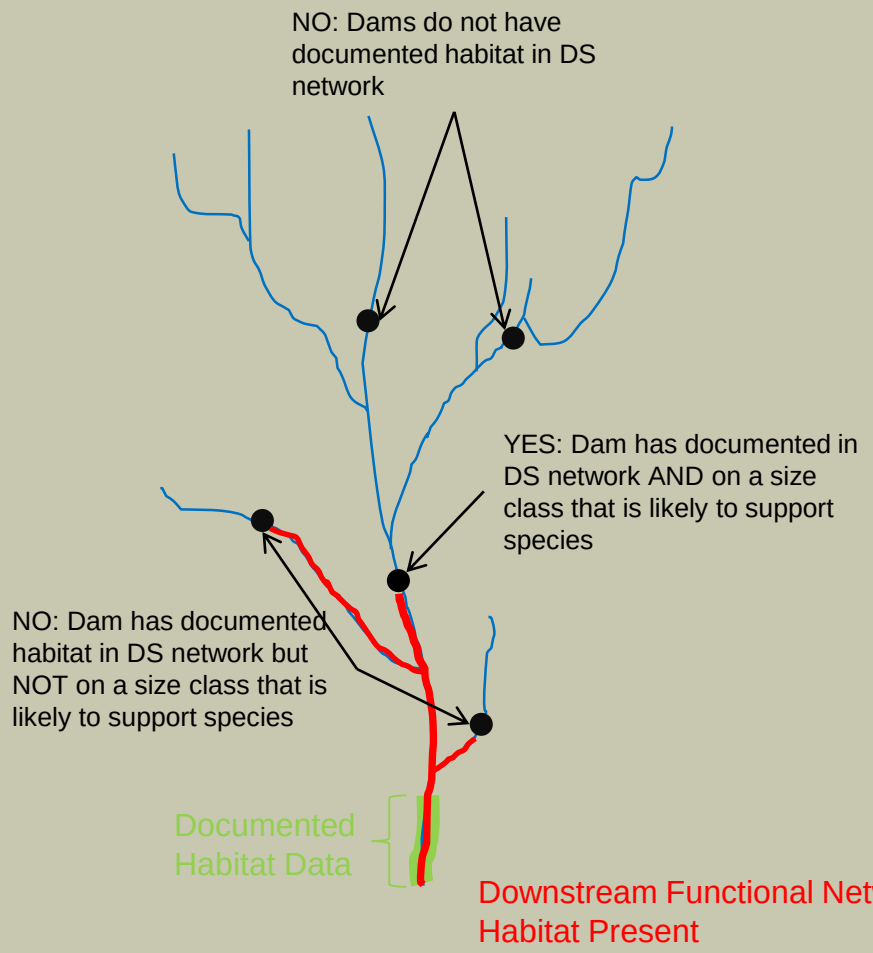
Striped Bass habitat in Downstream Functional Network

- Category: Ecological
- Presence of striped bass downstream of dam. Based on:
  1. Documented habitat in some portion of the dam's downstream functional network
  2. **AND** Dam is on a stream that is likely to support that species based on stream size
     1. Size 3b+ Rivers
- Fish habitat data from multiple sources. See the Map Layer descriptions for more details.
- Unit: Unitless Classes: "Current", "Historical", "None Documented"



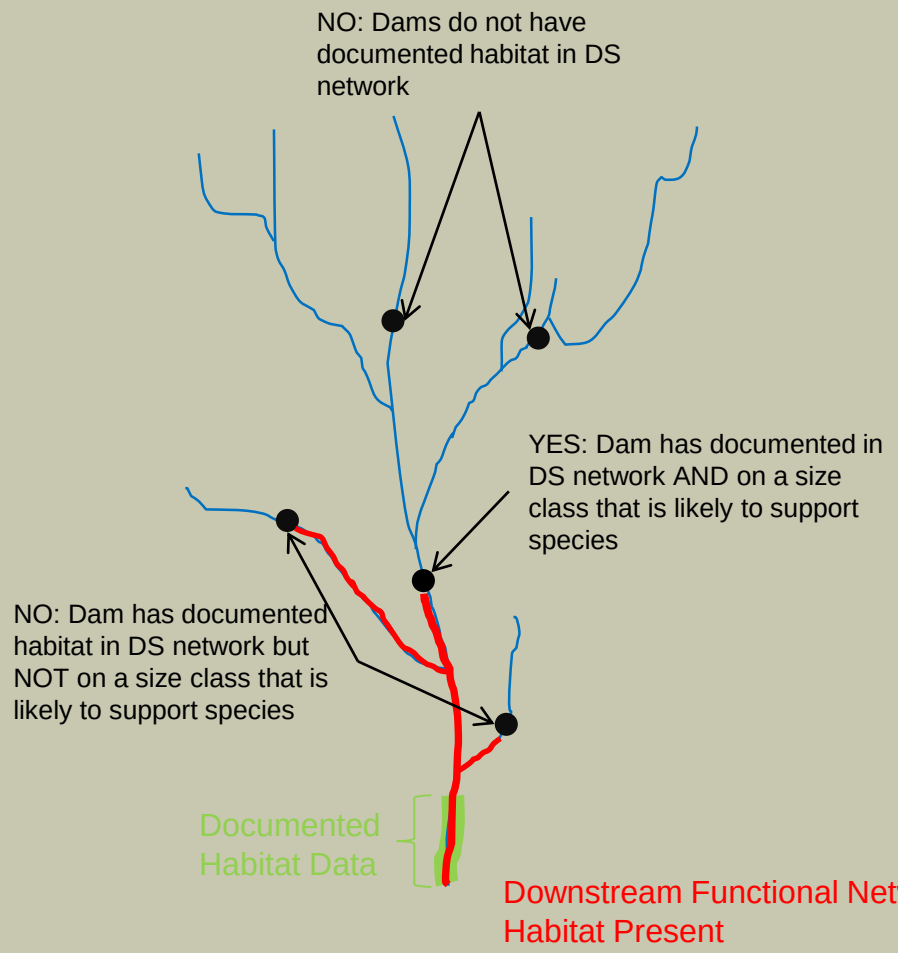
Atlantic Sturgeon habitat in Downstream Functional Network

- Category: Ecological
- Presence of Atlantic sturgeon downstream of dam. Based on:
  1. Documented habitat in some portion of the dam's downstream functional network
  2. **AND** Dam is on a stream that is likely to support that species based on stream size
     1. Size 4+ Rivers
- Fish habitat data from multiple sources. See the Map Layer descriptions for more details.
- Unit: Unitless Classes: "Current", "Historical", "None Documented"



Atlantic Salmon habitat in Downstream Functional Network

- Category: Ecological
- Presence of Atlantic Salmon downstream of dam. Based on:
  1. Documented habitat in some portion of the dam's downstream functional network
  2. **AND** Dam is on a stream that is likely to support that species based on stream size
     1. Size 1a+ Rivers
- Fish habitat data from multiple sources. See the Map Layer descriptions for more details.
- Unit: Unitless Classes: "Current", "Historical", "None Documented"



Native Fish Species Richness - HUC 8

- Category: Ecological - Resident
- Current native fish species richness in the watershed within which the barrier is located
- Based on NatureServe watershed (8-digit HUC) data
- Unit: #
- Sort Order: Descending

Rare Fish in HUC8

- Category: Ecological - Resident
- Count of rare (G1-G3) fish species in the watershed within which the barrier is located
- Based on NatureServe watershed (HUC8) data
- Unit: #
- Sort Order: Descending

Rare Mussels in HUC8

- Category: Ecological - Resident
- Count of rare (G1-G3) mussel species in the watershed within which the barrier is located
- Based on NatureServe watershed (HUC8) data
- Unit: #
- Sort Order: Descending

Rare Crayfish in HUC8

- Category: Ecological - Resident
- Count of rare (G1-G3) crayfish species in the watershed within which the barrier is located
- Based on NatureServe watershed (HUC8) data
- Unit: #
- Sort Order: Descending

Barrier within EBTJV Catchment with Trout

- Category: Ecological - Resident
- Barrier within an NHD catchment occupied by trout based on Eastern Brook Trout Joint Venture (EBTJV) data. (Mark Hudy 2012)
- Catchments with trout identified by the query “Trout =1”

- Unit: Boolean
- Sort Order: Descending

Barrier within Modeled Trout Catchment

- Category: Ecological - Resident
- Barrier within a catchment with modeled brook trout occupancy. (DeWeber & Wagner 2015)
- Catchments occupied by brook trout identified using the "occur46" scenario from DeWeber & Wagner 2015:
  - a binary classification (1 = present; 0 = absent) of Brook Trout occurrence based on a threshold that was equal to prevalence in the training data set, which produces near-optimal classification accuracy and could be used when false positives and false negatives have equal costs.
- Unit: Boolean
- Sort Order: Descending

Barrier blocks EBTJV 2012 Catchments

- Category: Ecological – Resident
- NHD catchments occupied by trout are in one of a barriers functional networks – either upstream or downstream, but not both
- Based on 2012 EBTJV data

- Unit: Boolean
- Sort Order: Descending

Barrier blocks Modeled Trout Catchments

- Category: Ecological – Resident
- NHD catchments occupied by trout are in one of a barriers functional networks – either upstream or downstream, but not both
- Based on DeWeber & Wagner 2015 data

- Unit: Boolean
- Sort Order: Descending

River Size Class

- Category: Size or System Type
- River size class based on NE Aquatic Habitat Classification

1a: Headwaters (<3.861 sq.mi.)
1b: Creeks (>= 3.861<38.61 sq.mi.)
2: Small River (>=38.61<200 sq. mi.)
3a: Medium Tributary Rivers (>=200<1000 sq.mi.)
3b: Medium Mainstem Rivers (>=1000<3861 sq mi)
4: Large Rivers (>=3861 < 9653 sq.mi.)
5: Great Rivers (>=9653 sq.mi.)

(measure = upstream drainage area)

- Unit: Class based on drainage area
- Sort Order: Ascending

Total # Reconnected Stream Size Classes >0.5 Miles(upstream + downstream)

- Category: Size or System Type
- Number of unique stream size classes >0.5 miles in total upstream and downstream functional networks
- Where stream size defined as:
  - 1a: Headwaters (<3.861 sq.mi.)
  - 1b: Creeks (>= 3.861<38.61 sq.mi.)
  - 2: Small River (>=38.61<200 sq. mi.)
  - 3a: Medium Tributary Rivers (>=200<1000 sq.mi.)
  - 3b: Medium Mainstem Rivers (>=1000<3861 sq.mi.)
  - 4: Large Rivers (>=3861 < 9653 sq.mi.)
  - 5: Great Rivers (>=9653 sq.mi.)

(measure = upstream drainage area)

Upstream Size Classes

- Category: Size or System Type
- Number of upstream stream size classes in a barrier's upstream functional network
- e.g. If a downstream functional network had small rivers (size 2) and medium tributary rivers (size 3a), while an upstream functional network had these as well as 2 miles of creek (size 1b), the gain would be 1.
- Unit: #
- Sort Order: Descending

Upstream Size Classes Gained by Removal / Bypass

- Category: Size or System Type
- Number of upstream stream size classes gained if dam were to be removed. Stream segments must be >0.5 miles to be considered a gain and the size class must not be present in the downstream functional network.
- e.g. If a downstream functional network had small rivers (size 2) and medium tributary rivers (size 3a), while an upstream functional network had these as well as 2 miles of creek (size 1b), the gain would be 1.
- Unit: #
- Sort Order: Descending

Miles of Cold Water Habitat in Total Functional Network

- Category: Size or System Type
- Miles of Cold Water habitat in the total functional network of a barrier
- Cold water habitat data from the Northeast Aquatic Habitat Classification

- Unit: Miles
- Sort Order: Descending

Miles of Cold or Cool Water Habitat in Total Functional Network

- Category: Size or System Type
- Miles of Cold or Cool Water habitat in the total functional network of a barrier
- Cold water habitat data from the Northeast Aquatic Habitat Classification

- Unit: Miles
- Sort Order: Descending