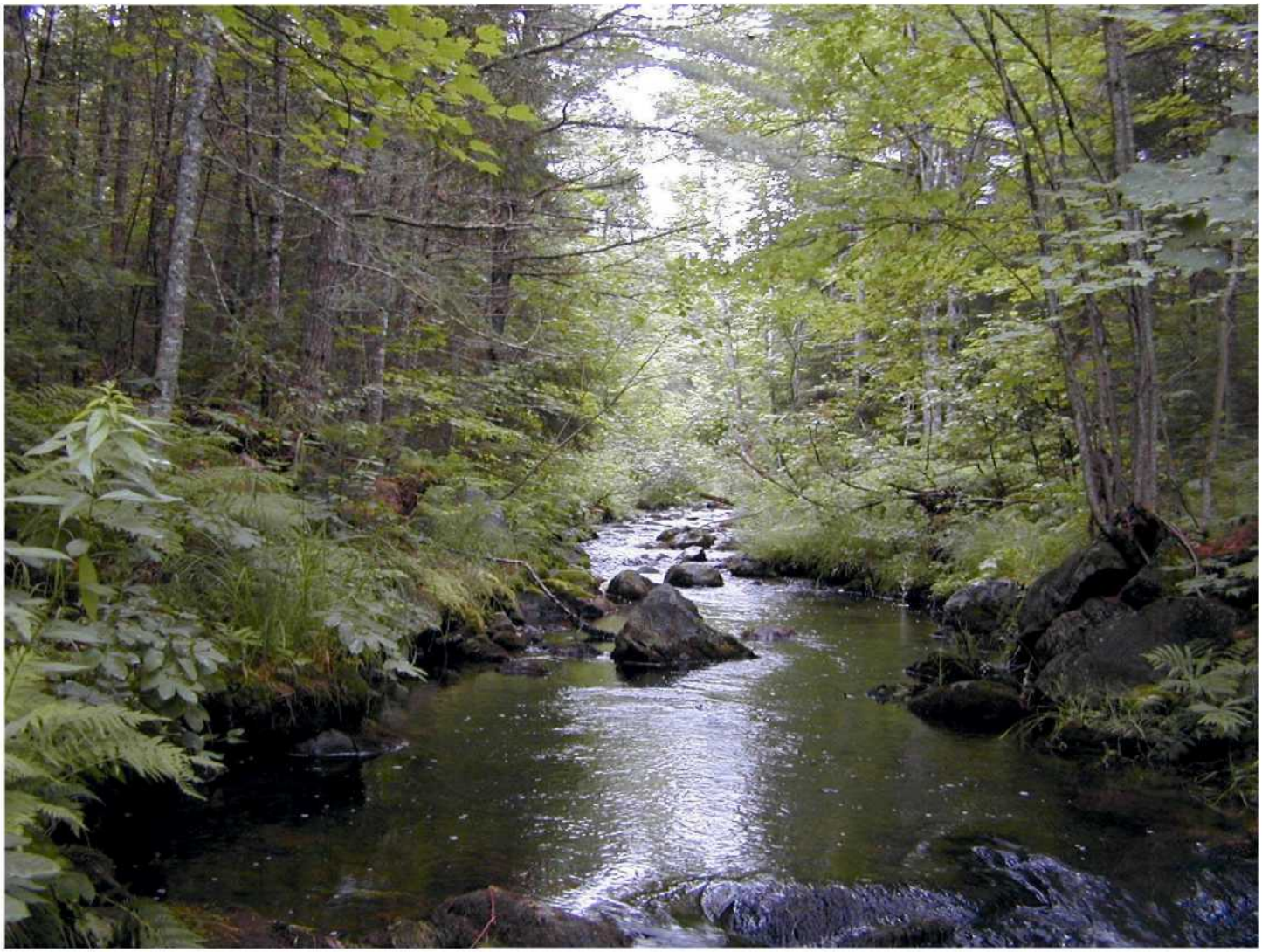
The Atlantic Salmon Restoration Handbook



Created by the Project SHARE Restoration Working Group

Stakeholders committed to maintaining, enhancing and protecting the productive capacity of aquatic ecosystems and the continued survival of Atlantic salmon by ensuring fish passage through barriers and the restoration of degraded habitats.

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About the Project SHARE
Restoration Working Group

Committee members

- Barbara Arter – Environmental Consultant
- Charlie Corlis – Land Use Regulatory Commission
- Dan Kircheis – National Marine Fisheries Service
- Dave Garcelon – USDA - Natural Resource Conservation Service
- Dean Bradshaw – Professional Engineer
- Greg Beane – Maine Department of Environmental Protection
- Joan Trial – Maine Atlantic Salmon Commission
- Nate Pennell – Washington County Soil and Water Conservation District
- Ryan Annis – Maine Department of Transportation
- Steven Koenig – Project SHARE (Salmon Habitat and River Enhancement)

Philosophy

The working group is a collaborative assembly of professionals that are tasked to review and coordinate projects designed to protect, enhance and restore aquatic habitats and the continued survival of Atlantic salmon in Maine's coastal watersheds. Information and decisions generated will be based on the best available information and consensus of all members who choose to participate. No decisions will be made based on the sole opinion of a single entity or organization. It is desired but not required that all members of the group participate in the decision making process or utilize any material or information that is produced.

Restoration Project Prioritization

Introduction

Aquatic habitat restoration activities are a vital part of the State of Maine Atlantic Salmon Conservation Plan for Seven Rivers (1997) and the Federal Endangered Species Act Recovery Plan for Atlantic Salmon in Maine. Habitat restoration includes a multitude of activities that address the watershed functions needed to support healthy watersheds. Water quality, water quantity, improving channel complexity, flood plain interactions, and the quality of riparian vegetation are important for watershed health.

Assessment of issues and problems associated with the 8 watersheds listed as part of the DPS under the Endangered Species Act is in the early stages. Several riparian buffer surveys and DEP 319 non point source pollution surveys have been conducted on several of the rivers identifying several hundred NPS sites. A DEP 319 Non Point Source Management Plan is being drafted for the Narraguagus River Watershed. Given the number of restoration sites identified, remaining to be identified, limitations on funding, and limitations on local capacity to conduct restoration activities, it is essential that restoration efforts are planned and prioritized in order to achieve maximum results. However, little information and few tools exist to assist Watershed Councils and other stakeholders with the task of assessing the relative impact of any given site and prioritizing restoration activity accordingly.

On December 10, 2001, The Narraguagus River NPS Management Plan Working Group and Project SHARE Research Committee sponsored a restoration prioritization workshop in Cherryfield, Maine. Representatives from NGOs, major landowners state and federal agencies, met to "brainstorm" ideas and issues associated with restoration site prioritization. A list of 51 Factors/Data/Processes potentially associated with restoration site prioritization and decision-making was compiled. Staff from the Maine Atlantic Salmon Commission summarized and grouped the list. On January 28, 2002, Project SHARE's Restoration Working Group met to develop guidelines to assist stakeholders with prioritizing restoration activities. The guidelines are intended to provide a relatively simple method for planning restoration activities. The guidelines within this document are the first phase of developing a prioritization scheme based on habitat and threats to habitat. It does not take into account economics, educational or recreational value which are all important aspects in the decision making process.

Restoration Project Prioritization Worksheet

Habitat restoration projects can be prioritized using criterion that assigns points based on: site location in the watershed, proximity to channel, proximity to mapped Atlantic salmon habitat, and the relative size of the problem. A maximum of 25 points may be assigned for each of the four criteria. Therefore, if a restoration project has a single problem associated with it, the maximum score would be 100 points. Multiple problems may be associated with a given restoration site. If that is the case, the site may be assigned a point value exceeding 100.

Worksheet

Your Name:_____ _____Date:_____

Site Name:_____

Project or site Description:_____

Points

1) Rank sub watershed priority: (See Appendix A)

Priority 1 = 25
Priority 2 = 20
Priority 3 = 15
Priority 4 = 10 _____
Priority 5 = 7
Priority 6 = 5
Priority 7 = 0

2) Proximity to channel: _____

Within channel to 25 feet of channel	= 25
25 to 250 feet of channel	= 15
Greater than 250 feet of channel	= 0

3) Proximity to mapped Atlantic salmon habitat: _____

Within habitat to 25 feet upstream	= 25
25 to 250 feet upstream of habitat	= 15
Greater than 250 feet upstream of habitat	= 0

4) Problem type:

- **Passage: (See Appendix B)** _____

Impedes Atlantic salmon passage	= 25
Impedes other fishes	= 15
Not a passage issue	= 0

- **Soil Loss: (see worksheet A)** _____

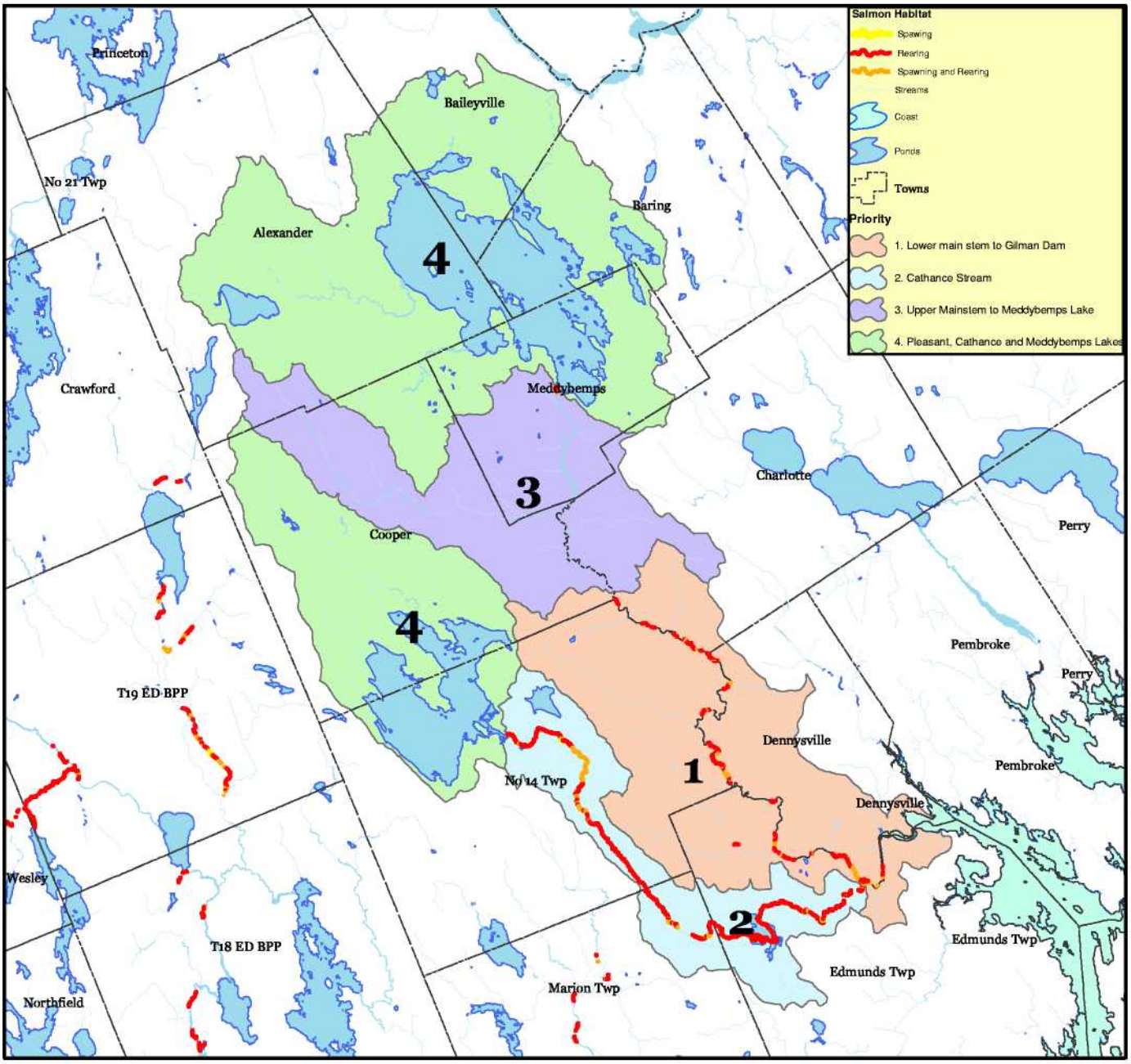
Large - Greater than 5 tons of soil loss	= 25
Medium - 1 to 5 tons of soil loss	= 15
Small - Less than 1 ton of soil loss	= 5
No soil loss	= 0

- **Point Source:** _____

Yes	= 25
No	=0

- **Riparian Buffer: (see worksheet B)** _____

Dennys River Priority Sub Watersheds



Datum: NAD 83
Coordinates: UTM, Zone 19
Units: Meters

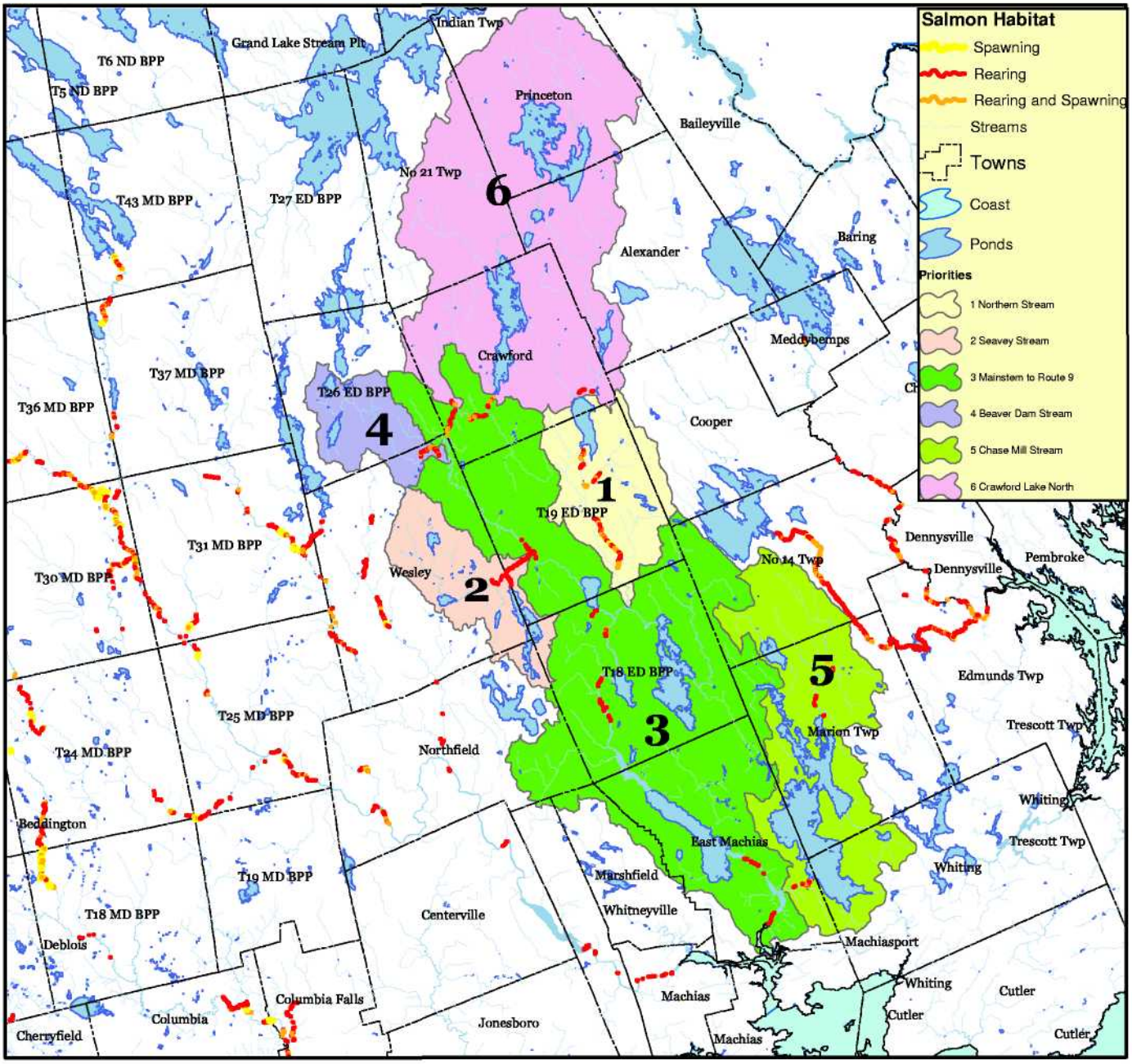
Data provided by:
U.S. Fish and Wildlife Service
Maine Office of GIS
Project SHARE
Maine Atlantic Salmon Commission

Drawn by:
Dan Kircheis
NOAA-Fisheries
For:
Project SHARE

N
W
E
S

0 0.5 1 2 3 4
Miles

East Machias River Priority Sub Watersheds



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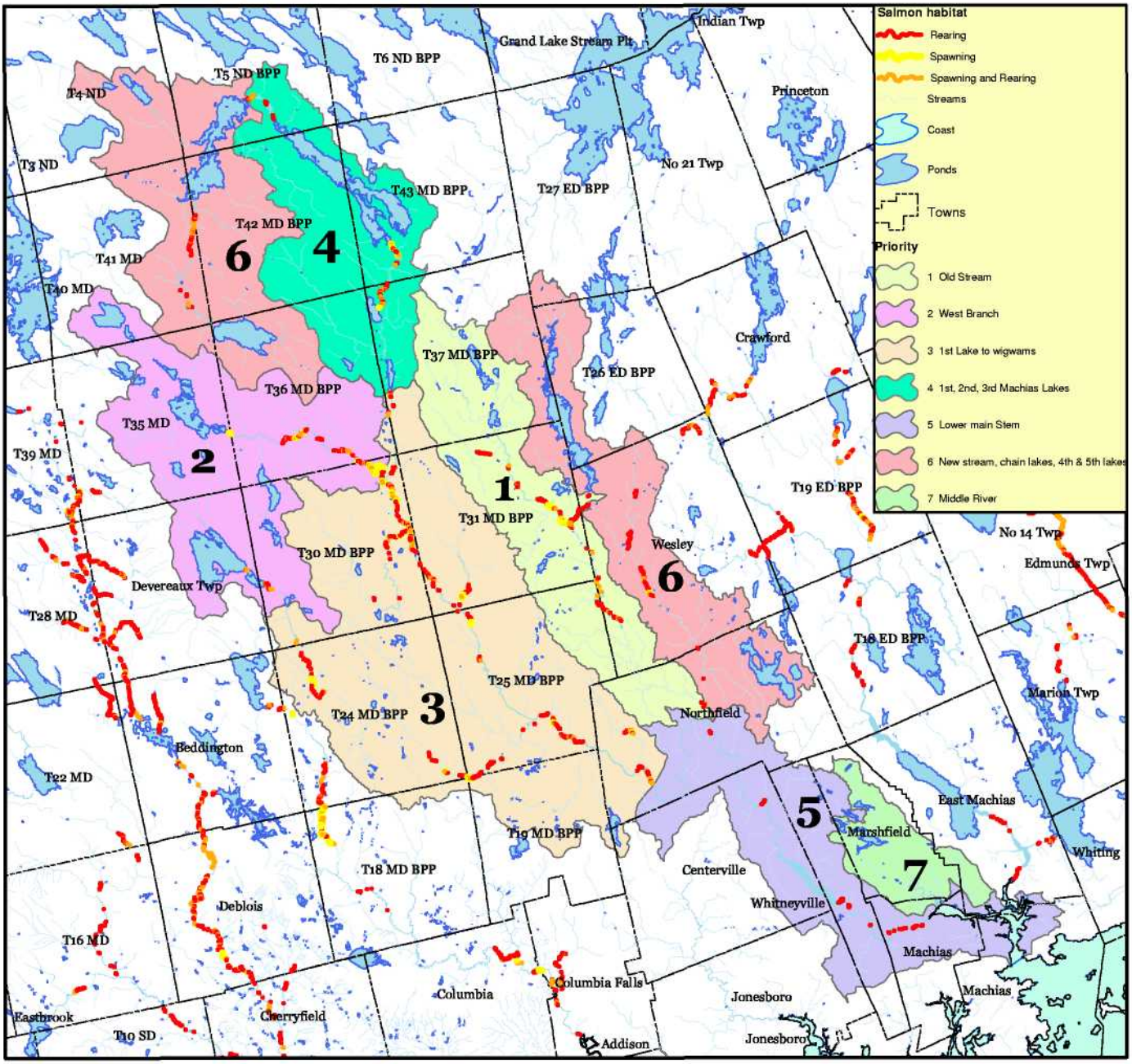
Maine Office of GIS
Project SHARE
Maine Atlantic Salmon Commission

Drawn By:
Dan Kircheis
NOAA-Fisheries
For:
Project SHARE

0 1.25 2.5 5 7.5 10 Miles

N
W E
S

Machias River Priority Sub Watersheds



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0 1.25 2.5 5 7.5 10 Miles

N
W
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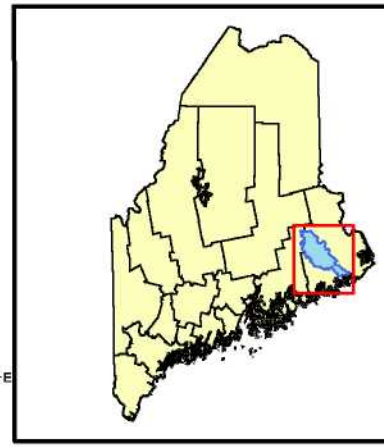
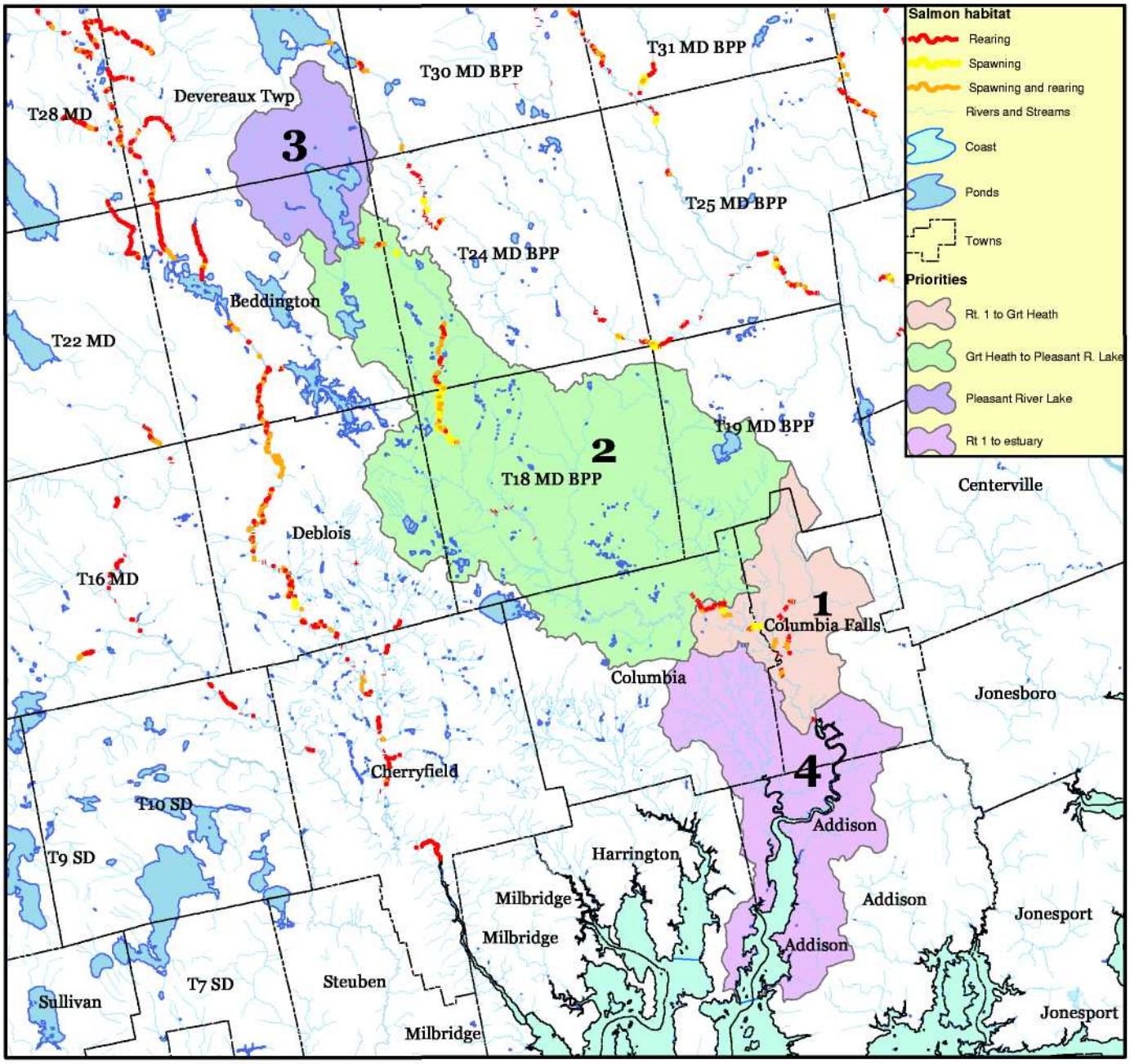


Pleasant River Priority Sub Watersheds



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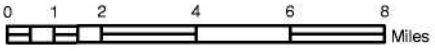
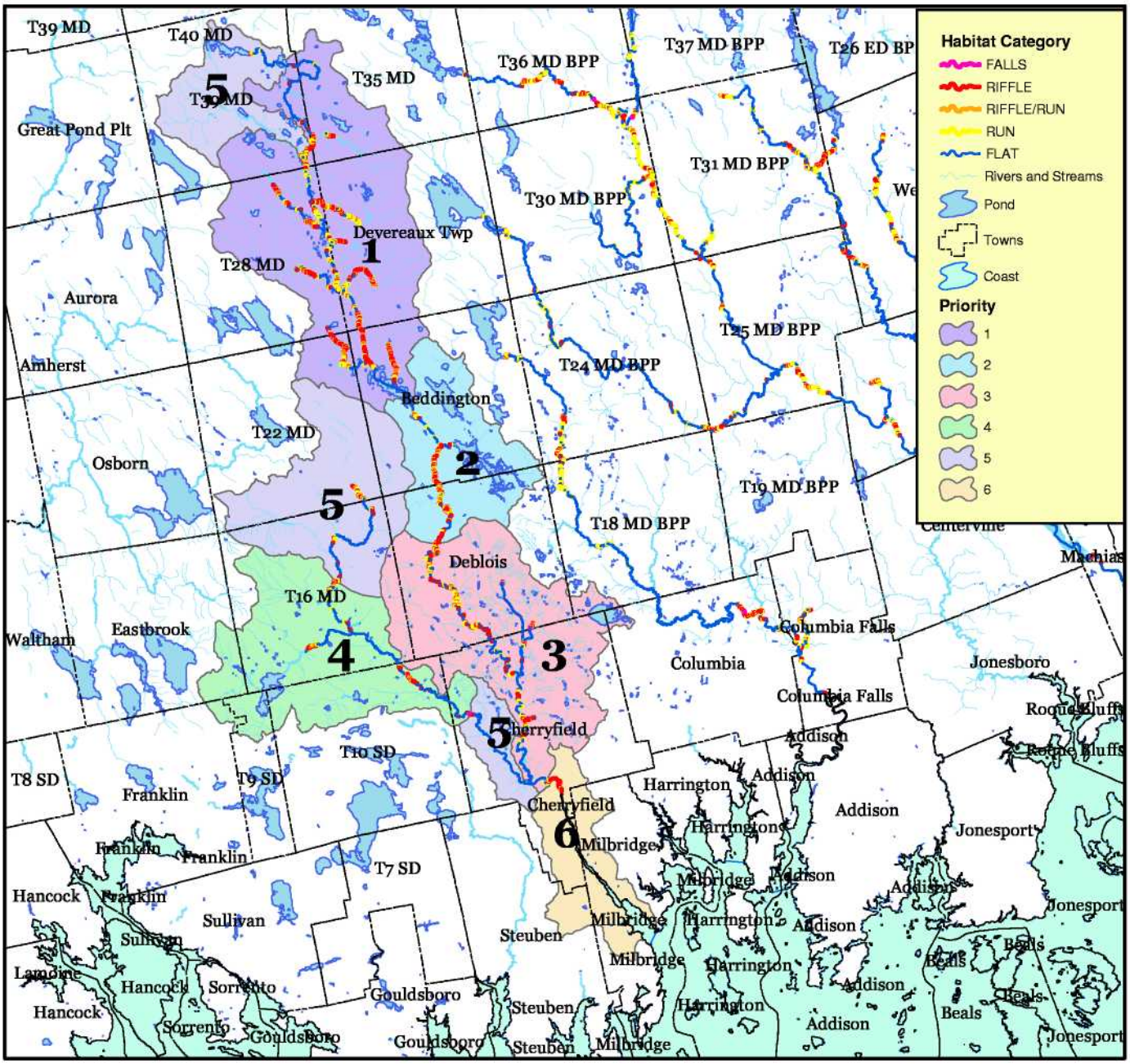


Narraguagus River Priority Sub Watersheds



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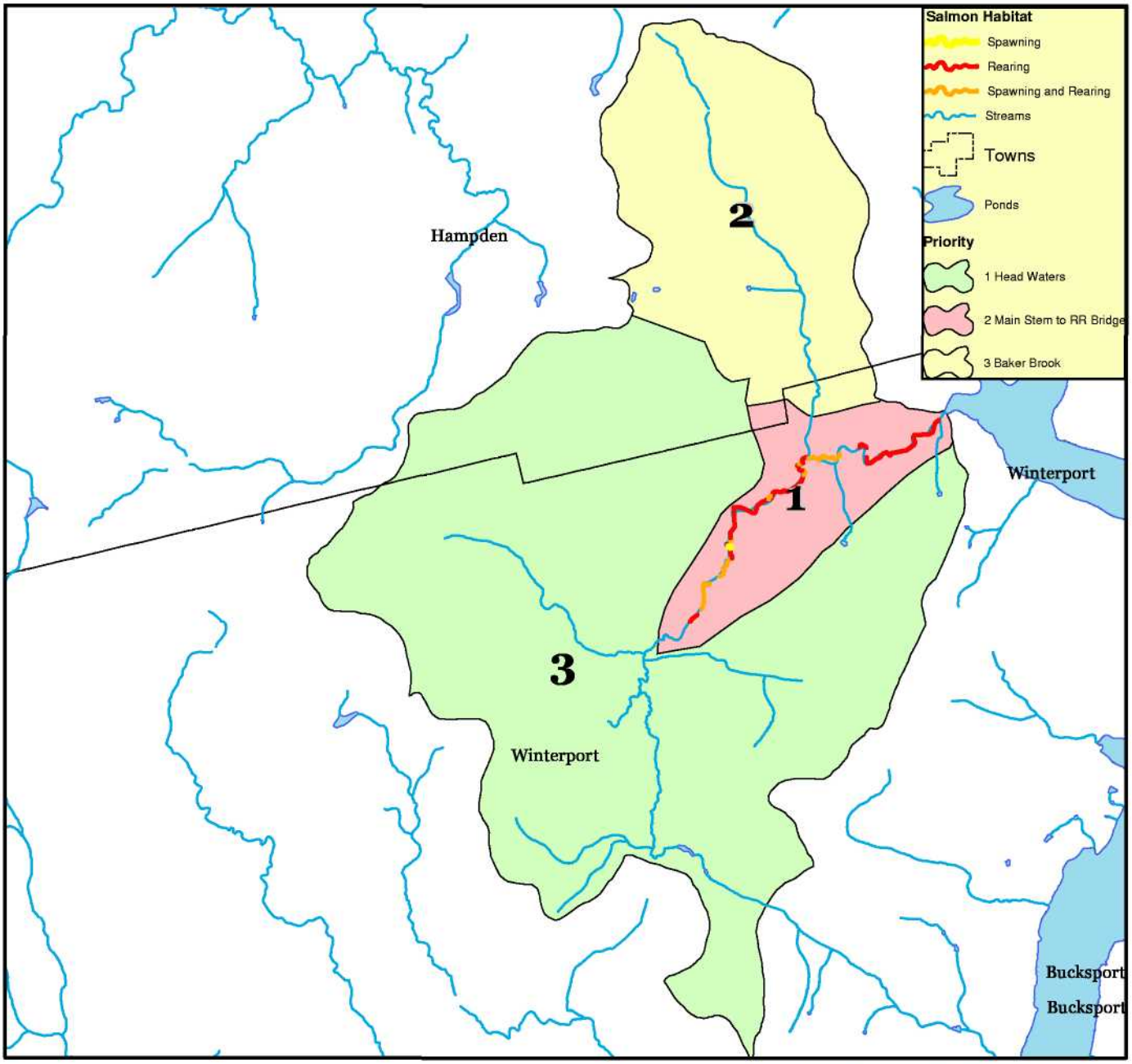
Cove Brook Priority Sub Watersheds



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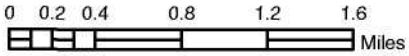
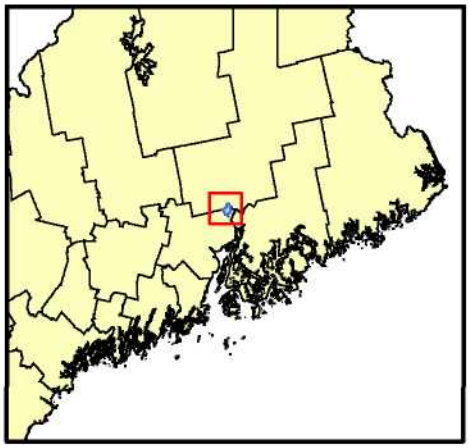
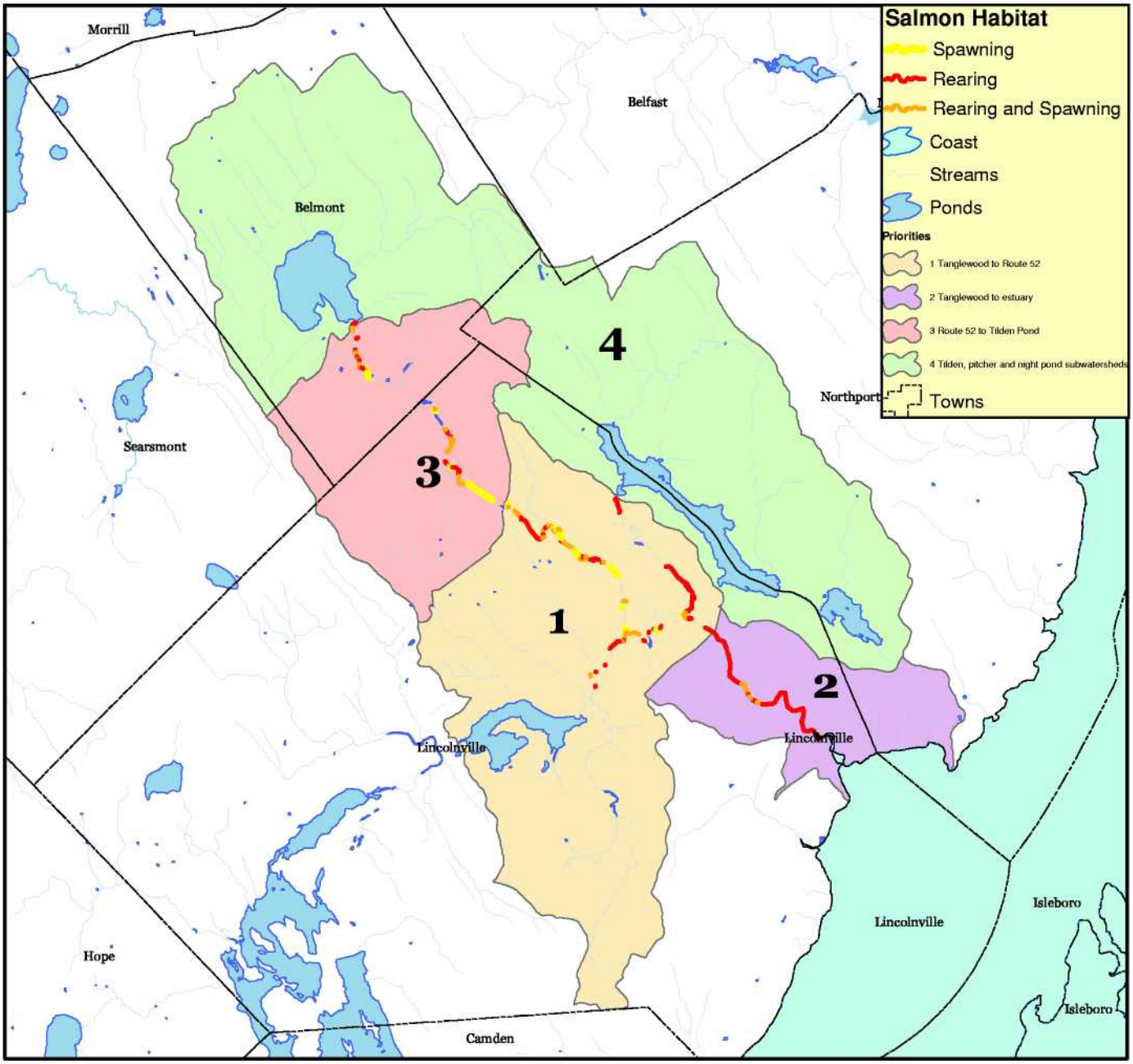




Ducktrap River Priority Sub Watersheds



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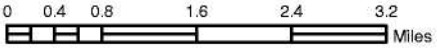
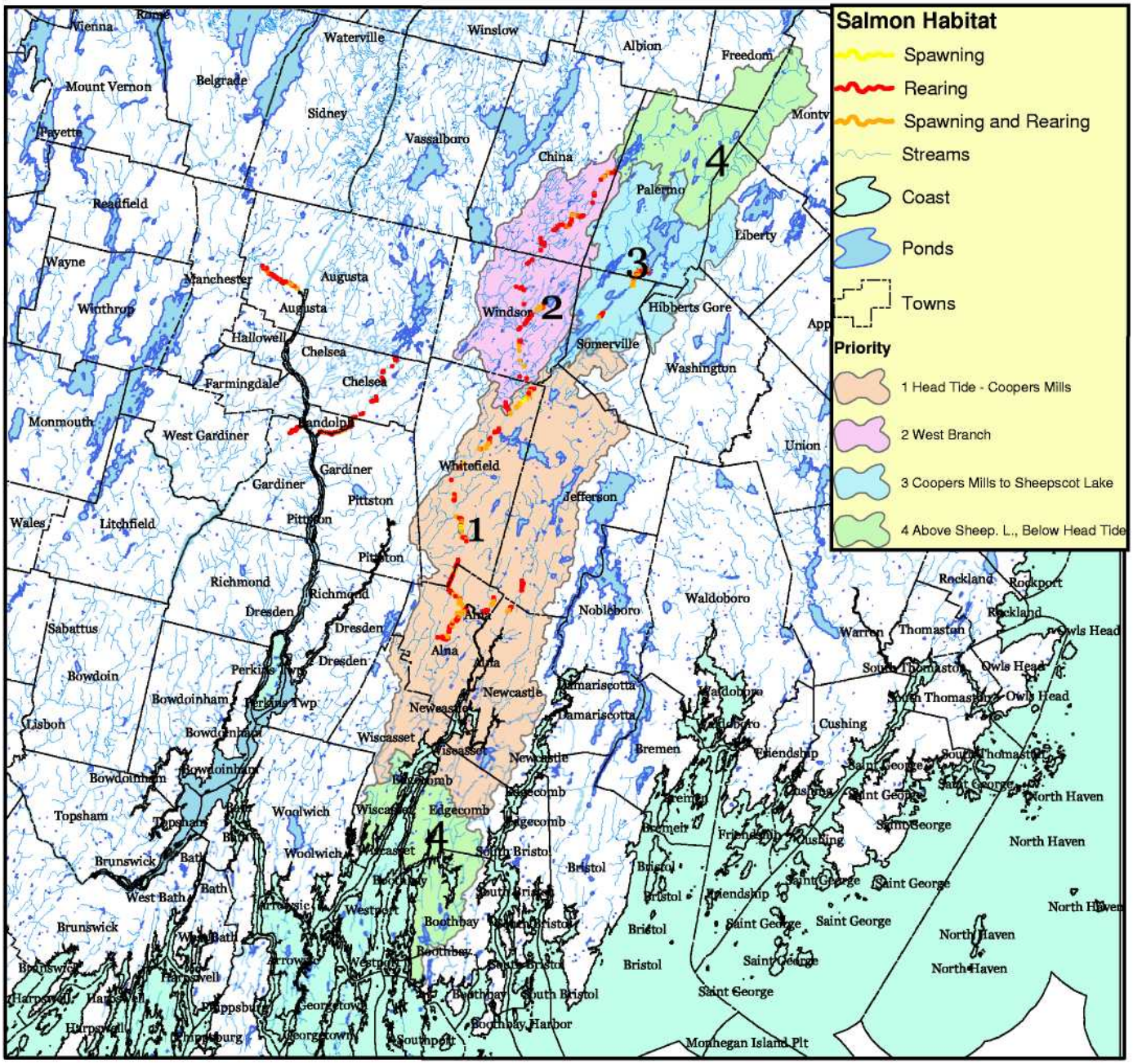


Sheepscot River Priority Sub Watersheds



Appendix B

FISH PASSAGE

Under natural channel conditions fish swim upstream and down, restricted only by hydraulic conditions. What fish passage features that potential restrict the natural movement of fish need to be identified?

1) Physical stream features that could impede or prevent any species of fish from swimming up- or downstream for even a brief period. These features can be part of the natural channel:

    a) Waterfall
    b) Riffle during low flows
    c) Ledge or set of ledges
    d) Debris jams/dams
    e) Ice dams

2) Physical features built by humans and other species of animals:
    a) Dams (with or without Fishways)
    b) Culverts
    c) Bridges
    d) Cattle fords

3) Passage can also be impeded or blocked by conditions that make swimming physiologically difficult. For each fish species there are combinations of temperature and dissolved oxygen that preclude migratory behavior. Additionally, heavy metals, pesticides, and other anthropogenic chemicals dissolved in water may repel fish, effectively blocking upstream passage. Features to look for:

    a) Domestic and industrial discharges
    b) Agricultural discharge/runoff
    c) Buildup of organic debris in channel
    d) Riparian buffer removal

Worksheet A

Erosion Calculations

Surveyors Name:_____Date: ___/____/___

Site Name:_____

Site Location:_____

UTM North:_____

East:_____

Site Description:_____
_____
_____
_____

Gully and Stream bank Erosion:

_____Avg. top width (T)

_____Avg. bottom width (B)

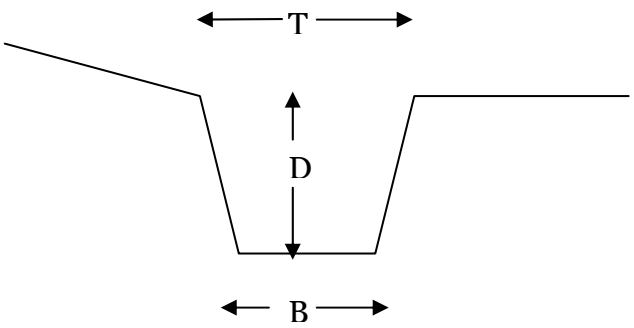
_____Avg. Depth (D)

_____Length (L)

_____(Ft^3) V= (T+B)/2 * D * L

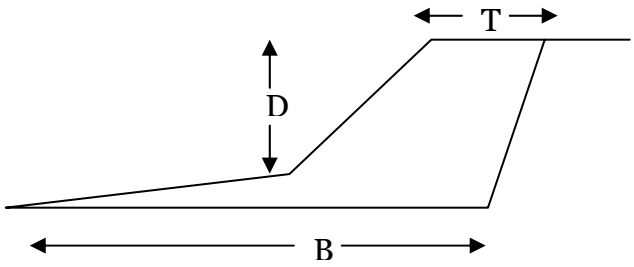
_____(Tons) = V * Density

Gully



Soil Texture	Density T/ft^3
Sand, sandy loam	.055
Loam	.045
Silty clay, clay loam	.040

Stream Bank



Worksheet B

Riparian Buffer Assessment Worksheet

Highest Value: Buffer with a 35 foot uncut stream zone and a managed, healthy vigorous forest for 65 feet with no soil disturbance up-slope from the forested zone. Buffer has large and tall trees nearest the bank. Trees are as tall as the stream is wide and some overhang. TALLY THE POINTS.

Forest Cover:

1) **How wide is the buffer?** Add **10 points** for every 20 ft. of trees growing within 100 feet of the stream Add **5 points** for every 20 ft. of shrubs growing within 100 feet of the stream	*(Combined total not to exceed 50)*
2) **What is the composition of the buffer?** Add **10 points** for a mixed softwood/hardwood stand. Add **10 points** for a dense (>80% cover) understory of shrubs or saplings.	

Effective Forest Cover:

1) Add **10 points** if the spacing between the trees is 0-10 ft or the trees provide continuous cover. (cover management)	
2) How much shade does the buffer provide to the stream? Add **10 points** if the buffer is located to the east or south of the stream (aspect)	
3) **How high is the buffer?** *(pick 1)* The buffer tree height is ½ the stream width (**5 points**) The buffer tree height is as tall as the stream is wide (**10 points**)	

Overland Water Flow:

1) **What is the major up-slope land cover?** ***(pick 1)*** The major up-slope land cover is trees (**10 points**) The major up-slope land cover is thick unmowed grass/shrubs (**5 points**) The major up-slope land cover is crops/mowed grass (lawns) (**2 points**) The major up-slope land cover is exposed soils or pavement (**0 points**)	
2) Add **10 points** if there are no signs of surface flow (gullies, swales) or subsurface pipes entering the stream	

Woody Debris (habitat) and length:

1) Add **10 points** if some trees are hanging over the stream or have fallen in the stream.	
2) Add **10 points** if the buffer is continuous over 2 or more stream segment lengths up and down stream.	

Total: (Should not exceed 140 points)

Scoring:

0 – 46 = 25

46 – 93 = 15

93 – 140 = 0

Courtesy of the Natural Resources Conservation Service – Riparian Area Inventory and Assessment Guide (10-27-2000)