

May 31, 2007  
(OZC 01-5400-3000)

Mr. Andy Holschbach  
Ozaukee County Planning, Resource, and  
Land Management Department  
Post Office Box 994  
121 West Main Street  
Port Washington, Wisconsin 53074-0994

RE: Classification and Prioritization Of Ozaukee County Stream Impediments

Dear Mr. Holschbach:

During 2006 and early 2007, Northern Environmental Technologies, Incorporated (Northern Environmental) identified, investigated, and evaluated over a hundred stream impediments in eleven Ozaukee County streams. In addition to providing written and oral reports of this work, we recently developed and applied criteria to segregate the stream impediments into prioritized classes (Attachments A and B). We anticipate that developing and applying these prioritized classes will facilitate remedial actions by both public or private entities.

### **CLASSIFICATION**

Northern Environmental, the Wisconsin Department of Natural Resources, and the Ozaukee County Planning, Resources, and Land Management Department (the County) identified many factors that can be considered when choosing criteria for classifying and prioritizing stream impediment removals and remediation (Attachment C). These abundant factors create an excessively sizeable data set when combined with the large number of identified impediments. They also make sequencing each and every impediment into an exactly-prioritized order without first grouping them into classes an unmanageably-cumbersome task. Such an endeavor is beyond the scope of this project and, fortunately, unnecessary. In its place, we have developed prioritized classifications and applied them to all known impediments.

Of the numerous factors that potentially influence classification and/or prioritization, a handful can be applied across the spectrum of identified impediments to reliably segregate them into classes. The primary factors chosen for classification were:

- ▲ Nature of Impediment Origin (i.e., natural vs. human induced or caused)
- ▲ Ownership (i.e., private vs. public)
- ▲ Association to Other Impediments
- ▲ Association to Potential Habitat(s)

Three primary classes were derived.

- ▲ Publicly-Owned Non-Natural Impediments (“Class A”)
- ▲ Privately-Owned Non-Natural Impediments (“Class B”)
- ▲ Naturally-Occurring Impediments (“Class C”)

Several sub-classes of Classes A and B that relate to the locations of known habitats and other impediments were formulated. Attachment A defines each classification and sub-classification. Attachment B summarizes impediment classifications.

## **PRIORITIZATION**

Within both non-natural impediment classes (i.e., Classes A and B), all sub-classes were prioritized based on:

- ▲ Relative cost (i.e., monetary expense and/or labor investment to remove/remediate an impediment)
- ▲ Likelihood of bolstering access to known habitat(s)

Relative cost (e.g., low cost vs. high cost) was chosen because assigning exact dollar-amount estimates to each impediment requires impediment-specific information (e.g., condition reports, remediation goals, etc.) from the public entity or private citizen/group responsible for each impediment. Further, exact cost estimates are completely dependent upon prevailing conditions, as well as the desires and goals of each responsible party.

Attachment A identifies the priority assigned to each sub-classification of impediment Classes A and B. Attachment B summarizes the prioritized classification of each impediment.

Removing naturally-occurring impediments (e.g., Class C) was never the goal or intent of this project and is not recommended. As such, “No Priority” was assigned to all Class C impediments.

### **Class A**

Class A impediments were arranged by assigning “High Priority” to those with both a relatively low cost to remove/remediate (e.g., county/municipal road crossings, railroad crossings, etc.) and relatively high likelihood of bolstering access to known habitat(s). “Moderate Priority” was assigned to those impediments that also have relatively high likelihood of bolstering known habitat access but will be relatively expensive to remove/remediate (e.g., 4-lane highway crossings). Finally, a “Low Priority” was placed on Class A impediments that do not isolate known habitat(s).

### **Class B**

Class B, or privately owned non-natural impediments, was prioritized based upon relative cost (e.g., effort level and/or duration to remove/remediate) and likelihood of bolstering access to known habitat(s). “High Priority” was assigned to those that require little effort and can be quickly completed (e.g., stone foot crossings, sediment accretions, etc.) to provide access to a known habitat. “Moderate Priority” was assigned to those that require relatively inexpensive but long-term measures (e.g., riparian vegetation management) or are relatively expensive and/or laborious (e.g., structure removal/modification). The “Moderate Priority” Class B impediments would also likely bolster access to a known habitat. Finally, “Low Priority” was assigned to Class B impediments that do not isolate known habitat(s).

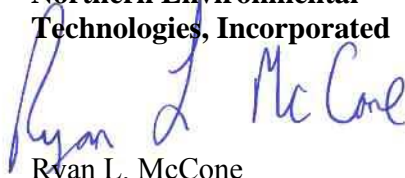
## **PRIORITIZATION MANAGEMENT**

The classification and prioritization system described above relates impediments to known habitats, other impediments, cost, and other factors. As such, changes to the prioritized classification of impediments should be anticipated as removals or remediation progresses. We recommend that the County review and

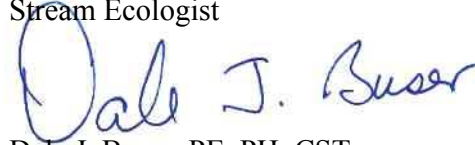
revise the prioritized classification of impediments annually or whenever an impediment is removed or remediated. Further, there are a number of factors that can be applied to a given stream or set of impediments to further refine their prioritizations (Attachment C). We recommend that the County and other involved parties take these factors into account if such refinement is deemed necessary.

We trust this information meets your needs. This submittal completes the agreed-to scope of work for this project. We look forward to seeing this project move forward and providing additional technical support on a voluntary basis (as time allows) and/or under a new work order. We will also be happy to provide grant-writing assistance to the County and other parties interested in impediment removal or remediation. Please contact us at (262) 241-3133 if you have any questions or comments.

Sincerely,  
**Northern Environmental  
Technologies, Incorporated**



Ryan L. McCone  
Stream Ecologist



Dale J. Buser, PE, PH, CST  
Principal Hydrologist

RLM/lmh

c: William Wawrzyn, Wisconsin Department of Natural Resources  
Thomas Slawski, Southeastern Wisconsin Regional Planning Commission

**ATTACHMENT A**

**STREAM IMPEDIMENT  
PRIORITIZED CLASSIFICATIONS**

# Ozaukee County Stream Passage Project: Stream Impediment Classification System

## Key to Impediment Classes

Non-Naturally Occurring Stream Impediments      Naturally-Occurring Stream Impediments  
 Publicly Owned: "Class A"      All Impediments: "Class C"  
 Privately Owned: "Class B"

## Key to Impediment Sub-Classes

**Sub-Class A1 = Involves a small-scale public works improvement (e.g., a county/municipal road crossing, railroad crossing, etc.)**

Sub-Class A1.1 = Isolates first habitat upstream of terminal confluence  
 There are no Class B or C impediments downstream

Sub-Class A1.2 = Isolates first habitat upstream of terminal confluence  
 There are one or more Class B or C impediments downstream

Sub-Class A1.3 = Does not isolate first habitat upstream of terminal confluence  
 Does isolate subsequent habitats  
 There are no Class B or C impediments downstream

Sub-Class A1.4 = Does not isolate first habitat upstream of terminal confluence  
 Does isolate subsequent habitats  
 There are one or more Class B or C impediments downstream

Sub-Class A1.5 = Upstream of a Sub-Class A2

**Sub-Class A2 = Involves a large-scale public works improvement (e.g., a four-lane highway crossing)**

Sub-Class A2.1 = Isolates first habitat upstream of terminal confluence  
 There are no Sub-Class A1 or Class B or C impediments downstream

Sub-Class A2.2 = Isolates first habitat upstream of terminal confluence  
 There are one or more Sub-Class A1 or Class B or C impediments downstream

Sub-Class A2.3 = Does not isolate first habitat upstream of terminal confluence  
 Does isolate subsequent habitats  
 There are no Sub-Class A1 or Class B or C impediments downstream

Sub-Class A2.4 = Does not isolate first habitat upstream of terminal confluence  
 Does isolate subsequent habitats  
 There are one or more Sub-Class A1 or Class B or C impediments downstream

**Sub-Class A3 = Does not isolate a known habitat**

High Priority  
(Relatively Low Cost)

Moderate Priority  
(Relatively High cost)

Low Priority  
(No Habitat Gain)

P  
U  
B  
L  
I  
C

**Sub-Class B1 = Small remediation effort (e.g., rock or sediment accretion removal)**

**Sub-Class B2 = Vegetation management**

**Sub-Class B3 = Structure removal/replacement or channel restoration**

**Sub-Class B4 = Does not isolate a known habitat**

High Priority  
(Relatively Low Cost)

Moderate Priority  
(Relatively High Cost)

Low Priority  
(No Habitat Gain)

P  
R  
I  
V  
A  
T  
E

**Class C = No removal/remediation recommended**

No Priority  
(Natural Condition)

N  
A  
T  
U  
R  
A  
L



**Northern Environmental**<sup>SM</sup>

Hydrologists • Engineers • Surveyors • Scientists

**We Provide Solutions**

**ATTACHMENT B**

**PROJECT STREAMS PRIORITIZED  
CLASSIFICATION SUMMARY**

**Stream Impediment Classifications: Ozaukee County Suspected Barriers**

Stream Name	Suspected Barrier Name <sup>1,2,3,4</sup>	Class A										Class B				Class C No Priority	Brief Description
		Removal/Replacement Priority										Removal/Replacement Priority					
		High					Moderate					High		Moderate			
Sub-Class A1.1	Sub-Class A1.2	Sub-Class A1.3	Sub-Class A1.4	Sub-Class A1.5	Sub-Class A2.1	Sub-Class A2.2	Sub-Class A2.3	Sub-Class A2.4	Sub-Class A3	Sub-Class B1	Sub-Class B2	Sub-Class B3	Sub-Class B4				
Fredonia Creek	PB2	√															Unburied Culverts - Public Park
	PB4												√				Unburied Culverts - Farm Crossing
	PB8				√												Low-Head Concrete Dam - Believed to be Publicly Owned
	PB10				√												Railroad Ballast Deposit
	PB11				√												Railroad Ballast Deposit
	PB14				√												Perched Culverts - Willow Valley Road
	PB15														√		Channel Flow Lost to Infiltration
	PB17												√				Channel Overgrown by Cattails
Girl Scout Camp Creek	PB1A														√		Woody Debris Jam
	PB2												√				Constricting Culverts Below Private Drive
	PB3		√														Long Culvert Overgrown With Vegetation at Inlet-Blueberry Road
	PB4												√				Earthen Dam - Stormwater Control
	PB5												√				Culvert - Private Pond Outlet
	PB6				√												Culvert - Railroad Crossing
	PB7												√				Channel Overgrown by Cattails
	PB9													√			Unburied Culvert - Private Drive
	PB10				√												Long Culvert Overgrown With Vegetation at Inlet and Outlet - Blueberry Road
	PB11												√				Channel Overgrown by Vegetation
Lac du Cours Outlet Creek	PB1	√															Constricted Abutments - River Road
	PB2											√					Riprap Deposit for Foot Crossing
	PB3				√												Cascading Culvert Scour Channel - Le Mont Boulevard
	PB4													√			Non-Functional Low-Head Dam - Lac du Cours Outlet

**Stream Impediment Classifications: Ozaukee County Suspected Barriers**

Stream Name	Suspected Barrier Name <sup>1,2,3,4</sup>	Class A										Class B				Class C No Priority	Brief Description
		Removal/Replacement Priority										Removal/Replacement Priority					
		High → Moderate					Moderate → Low					High → Moderate		Moderate → Low			
Sub-Class A1.1	Sub-Class A1.2	Sub-Class A1.3	Sub-Class A1.4	Sub-Class A1.5	Sub-Class A2.1	Sub-Class A2.2	Sub-Class A2.3	Sub-Class A2.4	Sub-Class A3	Sub-Class B1	Sub-Class B2	Sub-Class B3	Sub-Class B4				
Mole Creek	PB1A														√	Relatively High-Gradient Reach	
	PB2		√													Perched Culvert - County Highway O	
	PB5		√													Man-Made Debris Jam - 9 <sup>th</sup> Avenue	
	PB14														√	Log Jam	
	MCβ33														√	Fallen Tree in Channel	
	MCβ16											√				Boulder Deposit for Foot Crossing	
	MCβ13														√	Fallen Tree in Channel	
	MCβ11														√	Fallen Tree in Channel	
	MCβ8														√	Fallen Tree in Channel	
	MCβ4														√	Fallen Tree in Channel	
	MCβ2														√	Log/Debris Jam on Boulders	
	MCβ1														√	Fallen Tree in Channel	
	MCβ3											√				Log Foot Bridge	
	MCβ7														√	Debris Jam	
	MCβ15														√	Log Jam	
	PB29													√		Perched Culvert - Private Crossing	
	PB30				√											Long Culverts - State Highway 33	
	PB31				√											Unburied Culvert - Cold Springs Road	
	PB33												√			Unburied Culvert - Private Drive	
	PB34A											√				Channel Overgrown by Vegetation	

**Stream Impediment Classifications: Ozaukee County Suspected Barriers**

Stream Name	Suspected Barrier Name <sup>1,2,3,4</sup>	Class A										Class B				Class C No Priority	Brief Description
		Removal/Replacement Priority										Removal/Replacement Priority					
		High → Moderate → Low										High → Moderate → Low					
Sub-Class A1.1	Sub-Class A1.2	Sub-Class A1.3	Sub-Class A1.4	Sub-Class A1.5	Sub-Class A2.1	Sub-Class A2.2	Sub-Class A2.3	Sub-Class A2.4	Sub-Class A3	Sub-Class B1	Sub-Class B2	Sub-Class B3	Sub-Class B4				
Mud Lake Outlet Creek	PB1													√			Constricted Culvert - Private Crossing
	PB2												√				Woody Debris Jam
	PB3													√			Channel Overgrown by Sand Bar Willow
	PB4				√												Stone Deposit - Pleasant Valley Road
	PB5				√												Culverts with Cascading/Scoured Outlets and Aggraded Inlets - County Highway NN
	PB8A												√				Steel Rubble and Log Jam
	PB10													√			Channel Overgrown by Vegetation
	PB12													√			Channel Overgrown by Vegetation
	PB15													√			Stone Deposit - Old, Failing Private Bridge

**Stream Impediment Classifications: Ozaukee County Suspected Barriers**

Stream Name	Suspected Barrier Name <sup>1,2,3,4</sup>	Class A										Class B				Class C No Priority	Brief Description
		Removal/Replacement Priority										Removal/Replacement Priority					
		High → Moderate → Low										High → Moderate → Low					
Sub-Class A1.1	Sub-Class A1.2	Sub-Class A1.3	Sub-Class A1.4	Sub-Class A1.5	Sub-Class A2.1	Sub-Class A2.2	Sub-Class A2.3	Sub-Class A2.4	Sub-Class A3	Sub-Class B1	Sub-Class B2	Sub-Class B3	Sub-Class B4				
River Edge Creek	PB1														✓	Channel Overgrown by Red Osier Dogwood ( <i>Cornus stolonifera</i> )	
	PB3		✓												✓	Narrow Abutments - County Highway Y Moderate-Gradient Reach	
	PB4											✓		✓		Narrow Abutments, Log jam - Nature Center Walking Trail	
	PB7											✓				Stone Deposit	
	PB8													✓		Perched Culvert - Farm Crossing	
	PB8A														✓	Log/Debris Jam	
	PB8B														✓	Log/Debris Jam with Scour Cascade	
	PB8C														✓	Log/Debris Jam with Scour Cascade	
	PB9												✓		✓	Channel Flow Lost to Wetland Dispersion and Overgrown Vegetation	
	PB11												✓			Channel Overgrown by Vegetation	
	PB12				✓											Long, Narrow Culvert - Shady Lane	
	PB12A												✓			Channel Overgrown by Vegetation	

**Stream Impediment Classifications: Ozaukee County Suspected Barriers**

Stream Name	Suspected Barrier Name <sup>1,2,3,4</sup>	Class A										Class B				Class C No Priority	Brief Description
		Removal/Replacement Priority										Removal/Replacement Priority					
		High → Moderate					Moderate → Low					High → Moderate		Moderate → Low			
Sub-Class A1.1	Sub-Class A1.2	Sub-Class A1.3	Sub-Class A1.4	Sub-Class A1.5	Sub-Class A2.1	Sub-Class A2.2	Sub-Class A2.3	Sub-Class A2.4	Sub-Class A3	Sub-Class B1	Sub-Class B2	Sub-Class B3	Sub-Class B4				
Sucker Creek	PB1														√	Sand Bar at Lake Michigan Outlet	
	PB6		√												√	Narrow Abutments, Inlet Aggraded - Lake Drive. Pervious Stone Deposit	
	PB7													√		No Access - Pond Outlet	
	PB8									√						Long Culverts - Interstate Highway 43	
	PB9									√						Long Culvert - County Highway P Overpass for Interstate Highway 43	
	PB10									√						Long Culverts - Interstate Highway 43	
	PB12					√										Constricted and Concrete-Lined Channel - County Highway A	
	PB13													√		Culverts with Scour Cascade - Farm Crossing	
	PB15													√		Unburied Culverts - Farm Crossing	
	PB16					√										Culvert with Aggraded Inlet and Outlet Scour - Cedar Beach Road	
	PB17													√		No Access Per Owner - Culvert Farm Crossing	
	PB18													√		Constricting Steel Culvert - Unused Farm Crossing	
	PB22									√						Long Culvert - Silver Beach Road Overpass for Interstate Highway 43	
	PB25										√					Long Culverts - Interstate Highway 43	

**Stream Impediment Classifications: Ozaukee County Suspected Barriers**

Stream Name	Suspected Barrier Name <sup>1,2,3,4</sup>	Class A										Class B				Class C No Priority	Brief Description	
		Removal/Replacement Priority										Removal/Replacement Priority						
		High → Moderate → Low										High → Moderate → Low						
		Sub-Class A1.1	Sub-Class A1.2	Sub-Class A1.3	Sub-Class A1.4	Sub-Class A1.5	Sub-Class A2.1	Sub-Class A2.2	Sub-Class A2.3	Sub-Class A2.4	Sub-Class A3	Sub-Class B1	Sub-Class B2	Sub-Class B3	Sub-Class B4			
Trinity Creek	PB2	√																Culvert Inlet Blocked with Stone Riprap - Cedarburg Road
	PB3	√																Railroad Ballast Deposit
	PB3A	√																Low-Head Dam with Riprap Lining - Trinity Creek Habitat Restoration Area
	PB3B	√																Low-Head Dam with Steel Spillway Grate - Trinity Creek Habitat Restoration Area
	TCβ16 <sup>5</sup>													√				Agricultural Sediment Accretions
	PB85										√							Channel Overly Widened for Culverts and Inlet overgrown with Vegetation
	PB95										√							Channel Entrenched and Widened for Culverts, Outlet Overgrown, Inlet Debris Jam
	PB105										√							Culvert Inlet and Outlet Overgrown with Vegetation
	PB115										√							Riprap Cascade at Culvert Inlet, Channel Dissipates to Overgrown Swale
	PB56			√														Low-Head Dam with Steel Spillway Grate - Trinity Creek Habitat Restoration Area
	TCβ1 <sup>6</sup>																√	Fallen Tree in Channel
	TCβ2 <sup>6</sup>																√	Fallen Trees in Channel
	TCβ7 <sup>6</sup>																√	Channel Flow Disperses in Wetland
	TCβ9 <sup>6</sup>																√	Fallen Trees in Channel
	TCβ11 <sup>6</sup>																√	Fallen Trees in Channel
	PB18 <sup>6</sup>														---			No Barrier - Confirmed During Winter 2007
	PB19 <sup>6</sup>													√				Perched Culverts - Tree Nursery Crossing
	TCβ12 <sup>6</sup>																√	Log and Debris Jam
	TCβ13 <sup>6</sup>																√	Log and Debris Jam
	TCβ14 <sup>6</sup>																√	Log and Debris Jam
	TCβ15 <sup>6</sup>												√					Channel Overgrown by Vegetation
	PB20 <sup>6</sup>													√				Constricted Culvert - Farm Crossing
	PB21 <sup>6</sup>													√				Unburied Culverts Improperly Elevated with Excessively-Shallow Bankfull Flow and Scour
	PB22A <sup>6</sup>																√	Channel Flow Disperses in Wetland

**Stream Impediment Classifications: Ozaukee County Suspected Barriers**

Stream Name	Suspected Barrier Name <sup>1,2,3,4</sup>	Class A										Class B				Class C No Priority	Brief Description
		Removal/Replacement Priority										Removal/Replacement Priority					
		High → Moderate → Low										High → Moderate → Low					
Sub-Class A1.1	Sub-Class A1.2	Sub-Class A1.3	Sub-Class A1.4	Sub-Class A1.5	Sub-Class A2.1	Sub-Class A2.2	Sub-Class A2.3	Sub-Class A2.4	Sub-Class A3	Sub-Class B1	Sub-Class B2	Sub-Class B3	Sub-Class B4				
Ulao Creek	UCβ1														√	Woody Debris Jam	
	PB4											√				Debris Jam at Culvert Inlet	
	UCβ6														√	Fallen Tree in Channel	
	PB6														√	Channel Flow Lost to Wetland Infiltration - Confirmed During Winter 2007	
	PB9A				---											<b>Barrier Removed - Steel Flume</b>	
	PB10								√							Long Culverts - Interstate Highway 43	
	PB13											√				Stone Ford / Horse Crossing with Cascade and Backwater Pool	
	PB14A														√	Log Jam and Sediment Accretion	
	PB19					√										Steel Flume - Below Railroad Bridge	
	PB20					√										Long, Unburied Culverts - County Highway O	
	PB21					√										Railroad Ballast Deposit	
	PB22												√			Channel Overgrown by Vegetation	

**Stream Impediment Classifications: Ozaukee County Suspected Barriers**

Stream Name	Suspected Barrier Name <sup>1,2,3,4</sup>	Class A										Class B				Class C No Priority	Brief Description
		Removal/Replacement Priority										Removal/Replacement Priority					
		High → Moderate					→ Low					High → Moderate		→ Low			
Sub-Class A1.1	Sub-Class A1.2	Sub-Class A1.3	Sub-Class A1.4	Sub-Class A1.5	Sub-Class A2.1	Sub-Class A2.2	Sub-Class A2.3	Sub-Class A2.4	Sub-Class A3	Sub-Class B1	Sub-Class B2	Sub-Class B3	Sub-Class B4				
Unnamed Creek 1	PB4														√	Channel Flow Lost to Wetland Dispersion	
	PB3												√			Channel Braids and Overgrown by Vegetation	
	PB1				√											Long Culverts - County Highway I	
	PB2												√			Constrictive Culvert - Walking Path Foot Crossing	
Unnamed Creek 2	PB2	√														Culverts with Sediment Accretions and Overgrown Vegetation - Evergreen Lane	
	PB3							√								Long Culverts with Sediment Accretions and Overgrown Vegetation - State Highway 57	
	PB4B7					√							√	√		Channel Lost to Agricultural Sedimentation. Overgrown Vegetation, Unburied Culverts - Willow Road,	
	PB78					√						√	√			Unburied Culvert - Hawthorne Drive, Woody Debris Jam and Overgrown Vegetation	
	PB8												√			Channel Lost to Overgrown Vegetation	
	PB9													√		No Access - Farm Crossing	

- Notes: 1. "Suspected Barrier" is defined as an investigated site likely to impeded adult and/or juvenile northern pike (*Esox lucius*) passage under certain conditions  
 2. "PB\_\_" denotes a suspected barrier identified and evaluated during 2006 inspection  
 3. Suspected barrier names including "β" denote those identified and/or evaluated during Northern Environmental's (2007) *Field Verification of Ozaukee County Stream Impediment Methodology*  
 4. Suspected barriers on each stream are listed beginning with the downstream-most impediment and ending with the upstream-most impediment  
 5. Suspected barrier located on Trinity Creek North Branch  
 6. Suspected barrier located on Trinity Creek South Branch  
 7. Reach was incorrectly labeled "PB7A" in Appendix K of Northern Environmental's (2006) *Stream Passage Impediments and Aquatic Habitat Fragmentation Inventory*.  
 8. Reach was incorrectly labeled "PB7B" in Appendix K of Northern Environmental's (2006) *Stream Passage Impediments and Aquatic Habitat Fragmentation Inventory*.

Symbols: √ = Suspected barrier present  
 --- = Suspected barrier has been removed

**ATTACHMENT C**

**FACTORS FOR REFINING  
IMPEDIMENT PRIORITIZATION**

## Suggested Criteria For Impediment Prioritization Refinement

- 1) Impediment Origin
  - a) Natural
    - i) Limited Lifespan
    - ii) Permanent or Reoccurring
    - iii) Material Composition (e.g., Wood, Vegetation, Sediment, Stone, Combination, etc.)
  - b) Indirect Human
  - c) Direct Human
    - i) Provides Valuable Benefit (Public or Private)
      - (1) Description of Structural Utility (e.g., road crossing; railroad crossing; dam, etc.)
      - (2) Emergency Access Requirements
    - ii) Provides Little/No Benefit
- 2) Ownership
  - a) Public
    - i) Federal
    - ii) State
    - iii) County
    - iv) Municipality
  - b) Private
    - i) Citizen
    - ii) Group
- 3) Isolated Habitat
  - a) Location(s)
    - i) Upstream of impediment
    - ii) Downstream of Impediment
    - iii) Upstream and Downstream of Impediment
  - b) Type, Quality, and Quantity
  - c) Access Duration
    - i) Perennial
    - ii) Intermittent
    - iii) Ephemeral
- 4) Target species
  - a) Life stages
  - b) Life requisite (e.g., Adult Cover, Spawning, Juvenile Development)
- 5) Symptom Or Cause
  - a) Impediment type
    - i) Vertical or perched
    - ii) Velocity
    - iii) Shallow Depth
    - iv) Lack of adequate jumping pool
    - v) Debris
  - b) Impediment Removal / Replacement Fixes Cause Of Problem
  - c) Impediment Removal / Replacement Only Addresses Symptom of Larger Problem
- 6) Obviousness of Public Benefit
  - a) Associated With A Public Access
  - b) Existing/Interested Non-Profit Group
  - c) Opportunity for Public Recognition of Problem/Solution
- 7) Removal Difficulty and/or Cost

- 8) Assessment Requirements
  - a) High and/or Expensive
  - b) Medium
  - c) Low and/or Inexpensive
- 9) Current Structural Integrity
- 10) Likelihood of Success
  - a) Historical Evidence of Resource Value/Use, Info source
  - b) Overall Improvement to Resources
- 11) Magnitude of Potential Improvement
  - a) Existing Habitat Quality
    - i) Stream
    - ii) Wetland
    - iii) Lake/Pond
    - iv) Floodplain
  - b) Impediment Location
    - i) Distance to Stream Outlet
    - ii) Position Relative to Other Impediments
    - iii) Position Relative to Existing Habitats
    - iv) Distance to a Viable Target Population
  - c) Access Improvement
    - i) Number of Habitat Areas
    - ii) Total Area of Habitat
    - iii) Stream Distance
  - d) Association with Other Improvement Efforts
  - e) Maximize Overall Ecological Improvement
    - i) Perennial/Ephemeral
    - ii) Riparian/Corridor
    - iii) Water Quality/Quantity
- 12) Anticipated Improvement Duration
  - a) LESA Model - Site Assessment Score
  - b) Association with Other Restoration/Reclamation Efforts
  - c) Association with Existing Preserves/Parks