Lentic Riparian-Wetland Area Prioritization Guide

A Process for Evaluating Management & Restoration Priorities for Non-Riverine Systems



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Introduction

The management and restoration of riparian-wetland areas across a landscape is most effectively accomplished by the use of a strategic prioritization process. This document provides a template for prioritizing lentic (non-riverine) sites and is designed to be used by offices to help organize and prioritize management and restoration efforts in lentic systems. This guide is intended to be used for prioritizing any riparian-wetland area other than a lotic (riverine) area. This prioritization guide is a simple refinement/modification of the process outlined in *Technical Reference 1737-17 "A Guide to Managing, Restoring, and Conserving Springs in the Western United States."* The process described in this guide is specific to only the management and restoration prioritization process; TR 1737-17 provides an effective step by step outline that should be used for completing comprehensive management and restoration for these systems. Although 1737-17 is specific to springs and seeps, the prioritization process described to all lentic systems.

This guide provides specific direction for implementing Step 4 (page 28) in Chapter V. of 1737-17 – Spring Management Assessment and Priorities (using an evaluation guide to determine management priority among multiple spring systems); and Step 1 (identify historical condition, desired condition, and restoration priority – page 33 in Chapter VI of 1737-17 – Spring Restoration). This process is the next logical step to be taken following the completion of (or during) a Proper Functioning Condition (PFC) assessment of the site.

Instructions

Lentic Area Identification Form: Fill out header information and check all elements present since more than one wetland type can occur at each site (e.g. seep and wet meadow). Briefly summarize the site with a description.

Lentic Area Management & Restoration Evaluation Form: Each site should be evaluated using the ten value and condition criteria listed on this form. *Place an "X" in the appropriate block and provide rationale comments for the criteria selected* (see pages 23-29 and 31-38 in 1737-17 for additional guidance). Use existing information to complete the evaluation. The prioritization ratings should be completed by an ID team familiar with the site being evaluated. Following completion of the prioritization form, an overall rating is determined based on the ID team's discussion. The ID team must review how the individual criteria were rated and give the site a high, moderate, or low overall priority ranking for both *management* and *restoration*. Following the evaluations, the team must then describe rationale for the rating and identify future management, restoration, and monitoring activities. An example of a completed Lentic Area Identification Form and Lentic Area Management and Evaluation Form are included starting on page 8.

Establishing Management Priorities

Management priorities are established by analyzing the criteria on the evaluation form and determining the degree to which some kind of management activity is necessary to maintain or improve the functionality and ecological integrity of the site. Examples of management *activities* would be a management change or critical implementation/compliance monitoring. Management priorities should be based on the need to maintain high value lentic sites that are in proper functioning condition or to ensure that those sites that are functional-at risk with an upward trend continue to improve. Sites that are more degraded (functional – at risk with a downward trend) will require restoration and should also be considered in the context of restoration priorities (below). As a result, higher priority sites for management will have higher values and require some kind of management activity. Lower management priorities will have lower values and/or only require limited management activity.

Establishing Restoration Priorities

Restoration priorities are established for sites that are degraded (not functioning properly with a loss of ecological integrity). Restoration priorities are determined by analyzing the evaluation form criteria and establishing a priority ranking. Lentic sites that are given a high restoration priority will be degraded (functional – at risk or-non-functional with a loss of ecological integrity), and have high values or have the potential to produce high values. Lower restoration priorities will be given to those sites with limited potential to produce high values and/or are already functioning properly.

Non-functional lentic sites have (by definition) lost functionality and are therefore not approaching a degradation threshold. As a result, non-functional lentic sites are generally less of a management and restoration priority than those that are functional – at risk unless they are associated with substantial values that are important to restore.

Database: These evaluations should be entered into the *Access Database* entitled "Lentic Prioritization Database." The site number for each entry is the primary key that is hyperlinked to the identification form, evaluation forms, and other data. This allows database users to instantly access linked information. In addition, the UTM fields allow linkage to spatial coverage in GIS.

Lentic Area Identification Form

Site Name:	Site Number:
Field Office:	Date:
Allotment:	UTM Coords:
Evaluators:	

Wetland Type: (check all that apply)

Spring/Seep (SPR/S): Groundwater discharge areas (water on the surface). In general, springs have more flow than seeps. This wetland type may occur in a lotic or lentic system.

Wet Meadow (WM): Surface inundated frequently enough to be dominated by hydrophytic vegetation.

Mesic Meadow (MM): Variable seasonal wetland – surface not	
inundated or only inundated for short periods of the year.	
Hydrophytic vegetation is not dominant.	

Reservoir (RES): An artificial (dammed) water body with at least 20 acres covered by surface water.

Small Reservoir (SMRES): An artificial (dammed) water body of less than 20 acres covered by surface water.

Lake (LAKE): A natural topographic depression collecting a body of water covering at least 20 acres with surface water.

Pothole or Small Mountain Lake (SMLAKE): A natural topographic depression collecting a body of water covering less than 20 acres with surface water.

Other (OTHER):

Developed Structures Present: Yes____No____

Description/Comments:

SOURCE: Modified from U.S. Lentic Wetland Health Assessment (survey) User Manual, Ecological Solutions Group, 2006.

Lentic Area Management & Restoration Evaluation Form

1. Jurisdictional Wetland Status		
High	Moderate	Low
High Potential for Jurisdictional Wetland (appears to meet <u>all</u> criteria for a wetland as defined in the 1987 U.S. Army Corp or Engineers Wetlands Delineation Manual <u>and</u> is tributary to a Navigable Stream – see Appendix A)	NA	Low Potential for Jurisdictional Wetland (appears to meet <i>all</i> criteria for a wetland as defined in the 1987 U.S. Army Corp or Engineers Wetlands Delineation Manual <u><i>but is not</i></u> tributary to a Navigable Stream – see Appendix A)
Rating:		
Comment:		
2. Tributary Status		
High	Moderate	Low
Spring/seep <i>is</i> tributary to a perennial stream system & provides a distinct & measurable flow of water to the stream	NA	Spring/seep <i>is not</i> tributary to a perennial stream system or exists as a result of a perennial stream (e.g. oxbow lake, riverine floodplain wetland)
Rating:		
Comment:		
3. TES Species Values		
High	Moderate	Low
Threatened, Endangered, or Sensitive (TES) species present	No TES species present but historic or refuge habitat for TES species is present	No TES species or historic or refuge habitat present
Rating:		
Comment:		
4. Existing Wetland Extent		
High	Moderate	Low
More than 2 acres dominated by Obligate, Facultative Wet, or Facultative plants	1-2 acres dominated by Obligate, Facultative Wet, or Facultative plants	Less than 1 acre dominated by Obligate, Facultative Wet, or Facultative plants
Rating:	·	
Comment:		

5. Existing Hydric Permanence

High	Moderate	Low
Perennial: Water at or near the surface or soils saturated year long. Fits Cowardin regimes: Permanently flooded, intermittently exposed, semipermanently flooded (see Appendix B)	Intermittent: Water at or near the surface or soils saturated for most of the year. Fits Cowardin regimes: Seasonally flooded, saturated (see Appendix B)	Ephemeral: Water <i>is not</i> at or near the surface and/or soils <i>are not</i> saturated each year. These sites are inundated or saturated at least 3 years over a 10 year period. Fits Cowardin regimes: Temporarily flooded, intermittently flooded. Artificially flooded systems also fit in this category (see Appendix B)

Rating: Comment:

6. Existing Community Condition (consider all factors)

High	Moderate	Low
 Natives > exotics (plant cover) Riparian zone dominated by wetland plant species High inherent water quality Used by more than one species of riparian obligate migratory birds 	 Natives > exotics (plant cover) but exotics present Riparian zone with approximate equal numbers of upland and wetland plant species Moderate inherent water quality Used by single species of riparian obligate migratory birds 	 Exotics > natives (plant cover) Riparian community dominated by upland species Low inherent water quality Not used by riparian obligate migratory birds
Rating:		
Comment:		
7. Potential Wetland Extent		
High	Moderate	Low
Potential for more than 2 acres dominated by Obligate, Facultative Wet, or Facultative plants	Potential for 1-2 acres dominated by Obligate, Facultative Wet, or Facultative plants	Potential for less than 1 acre dominated by Obligate, Facultative Wet, or Facultative plants

Rating:

Comment:

8. Potential Hydric Permanence

High	Moderate	Low
Perennial: Potential for water to be at or near the surface or soils saturated year long. Fits Cowardin regimes: Permanently flooded, intermittently exposed, semipermanently flooded (see Appendix B)	Intermittent: Potential for water to be at or near the surface or soils saturated for most of the year. Fits Cowardin regimes: Seasonally flooded, saturated (see Appendix B)	Ephemeral: Little to no potential for water to be at or near the surface and/or soils saturated each year (these sites may be inundated or saturated at least 3 years over a 10 year period. Fits Cowardin regimes: Temporarily flooded, intermittently flooded. Artificially flooded systems also fit in this category (see Appendix B)

Rating: Comment:

9. Potential Community Condition (consider all factors)

High	Moderate	Low
 Potential for natives > exotics (plant cover) Potential for riparian zone dominated by wetland plant species Potential for high water quality Potential for use by more than one species of riparian obligate migratory birds 	 Potential for natives > exotics (plant cover) but exotics present Potential for riparian community to have approximately equal numbers of upland and wetland plant species Potential for moderate water quality Potential for use by riparian obligate migratory birds 	 Exotics > natives (plant cover) Potential for plant community to be dominated by upland species Potential for low water quality Low potential for use by riparian obligate migratory birds
Rating:		
Comment:		

10. Existing Functionality

High	Moderate	Low
Functioning at Risk (FAR) with a downward or no apparent trend	NA	Proper Functioning Condition (PFC) or Functioning at Risk (FAR) with an upward trend (Non-functional systems could be high or low depending on values and importance)
Rating:		
Comment:		

Summary

Management Priority

High	
Moderate	
Low	

Restoration Priority

High	
Moderate	
Low	

Rationale for Rating:

Management, Restoration, and Monitoring Direction:

Example—Tin Creek Meadows

Lentic Area Identification Form

Sit Fi Al Ev	te Name: <u>Ti</u> eld Office: <u>(</u> lotment:] valuators: <u>S</u>	n Creek Meadows Dwyhee Big Springs S. Smith, T. Burton	Site Number: 0111 Date: 5/18/2006 UTM Coords:	
W	etland Type	e: (check all that app	ly)	
Sp In in	oring/Seep (S general, sprir a lotic or lent	PR/S): Groundwater dis- gs have more flow than ic system.	charge areas (water on the surface). seeps. This wetland type may occur	_X_
W do:	et Meadow (minated by h	WM): Surface inundated ydrophytic vegetation.	l frequently enough to be	X_
Me inu Hy	esic Meadow andated or on drophytic ve	(MM): Variable season ly inundated for short pe getation is not dominant	al wetland – surface not eriods of the year.	X_
Re 20	eservoir (RES acres covere	5): An artificial (dammed l by surface water.	d) water body with at least	
Sn tha	nall Reservoi an 20 acres co	r (SMRES): An artificia vered by surface water.	al (dammed) water body of less	
La of	ke (LAKE): water coverin	A natural topographic do again at least 20 acres with	epression collecting a body surface water.	
Po dej sur	thole or Sma pression colle rface water.	ll Mountain Lake (SM cting a body of water co	LAKE): A natural topographic overing less than 20 acres with	
Ot	her (OTHER):		
Develope	d Structure	s Present: YesNo	_X	

Description/Comments:

This site has several groundwater discharge areas with wet meadow habitat concentrated in the low lying microsites. Mesic meadow habitat is located along the fringe of the wetland on the more elevated spots.

Tin Creek Meadows



Figure 1. Overview looking northwest



Figure 2. From bottom looking north



Figure 3. Headcut at bottom of meadow

Lentic Area Management & Restoration Evaluation Form

1. Jurisdictional Wetland Status			
High	Moderate	Low	
High Potential for Jurisdictional Wetland (appears to meet <u>all</u> criteria for a wetland as defined in the 1987 U.S. Army Corp or Engineers Wetlands Delineation Manual <u>and</u> is tributary to a Navigable Stream – see Appendix A)	NA	Low Potential for Jurisdictional Wetland (appears to meet <i>all</i> criteria for a wetland as defined in the 1987 U.S. Army Corp or Engineers Wetlands Delineation Manual <u><i>but is not</i></u> tributary to a Navigable Stream – see Appendix A)	
Rating: HIGH			
Comment: Meets all wetland criteria in the	1987 COE manual & is tributary to Tin Cr	eek, a non-navigable stream with a	
2. Tributary Status			
High	Moderate	Low	
Spring/seep <i>is</i> tributary to a perennial stream system & provides a distinct & measurable flow of water to the stream	NA	Spring/seep <i>is not</i> tributary to a perennial stream system or exists as a result of a perennial stream (e.g. oxbow lake, riverine floodplain wetland)	
Rating: HIGH			
Comment: Seep is tributary to Tin Creek			
3. TES Species Values			
High	Moderate	Low	
Threatened, Endangered, or Sensitive (TES) species present	No TES species present but historic or refuge habitat for TES species is present	No TES species or historic or refuge habitat present	
Rating: LOW			
Comment: No TES species or historic refug	ge habitat present		
4. Existing Wetland Extent			
High	Moderate	Low	
More than 2 acres dominated by Obligate, Facultative Wet, or Facultative plants	1-2 acres dominated by Obligate, Facultative Wet, or Facultative plants	Less than 1 acre dominated by Obligate, Facultative Wet, or Facultative plants	
Rating: MODERATE			
Comment: Wetland is slightly less than 2 acres as determined by aerial photos			

5. Existing Hydric Permanence

High	Moderate	Low
Perennial: Water at or near the surface or soils saturated year long. Fits Cowardin regimes: Permanently flooded, intermittently exposed, semipermanently flooded (see Appendix B)	Intermittent: Water at or near the surface or soils saturated for most of the year. Fits Cowardin regimes: seasonally flooded, saturated (see Appendix B)	Ephemeral: Water is not at or near the surface and/or soils <i>are not</i> saturated each year. These sites are inundated or saturated at least 3 years over a 10 year period. Fits Cowardin regimes: Temporarily flooded, intermittently flooded. Artificially flooded systems also fit in this category (see Appendix B)

Rating: HIGH

Comment: Seep is perennial based on soils, obligate plants, and historical information

6. Existing Community Condition (consider all factors)

High	Moderate	Low	
 Natives > exotics (plant cover) Riparian zone dominated by wetland plant species High inherent water quality Used by more than one species of riparian obligate migratory birds 	 Natives > exotics (plant cover) but exotics present Riparian zone with approximate equal numbers of upland and wetland plant species Moderate inherent water quality Used by single species of riparian obligate migratory birds 	 Exotics > natives (plant cover) Riparian community dominated by upland species Low inherent water quality Not used by riparian obligate migratory birds 	
Rating: MODERATE	•		
Comment: Sedges common as are timothy	Comment: Sedges common as are timothy & bluegrass		
7. Potential Wetland Extent			
High	Moderate	Low	
Potential for more than 2 acres dominated by Obligate, Facultative Wet, or Facultative plants	Potential for 1-2 acres dominated by Obligate, Facultative Wet, or Facultative plants	Potential for less than 1 acre dominated by Obligate, Facultative Wet, or Facultative plants	
Kating: MODEKATE			

Comment: Restoration efforts would likely not change overall wetland extent; however, micro-sites dominated by facultative plants would likely be replaced with obligate and/or facultative wet plants

8. Potential Hydric Permanence

High	Moderate	Low	
Perennial: Potential for water to be at or near the surface or soils saturated year long. Fits Cowardin regimes: Permanently flooded, intermittently exposed, semipermanently flooded (see Appendix B)	Intermittent: Potential for water to be at or near the surface or soils saturated for most of the year. Fits Cowardin regimes: Seasonally flooded, saturated (see Appendix B)	Ephemeral: Little to no potential for water to be at or near the surface and/or soils saturated each year (these sites may be inundated or saturated at least 3 years over a 10 year period. Fits Cowardin regimes: Temporarily flooded, intermittently flooded. Artificially flooded systems also fit in this category (see Appendix B)	

Rating: HIGH

Comment: Live surface water is present all year but reduced in extent due to headcut. Restoration will protect the presence of perennial water and may increase extent of the saturated zone

9. Potential Community Condition (consider all factors)

High	Moderate	Low
 Potential for natives > exotics (plant cover) Potential for riparian zone dominated by wetland plant species Potential for high water quality Potential for use by more than one species of riparian obligate migratory birds 	 Potential for natives > exotics (plant cover) but exotics present Potential for riparian community to have approximately equal numbers of upland and wetland plant species Potential for moderate water quality Potential for use by riparian obligate migratory birds 	 Exotics > natives (plant cover) Potential for plant community to be dominated by upland species Potential for low water quality Low potential for use by riparian obligate migratory birds

Rating: HIGH

Comment: Potential for more slightly more obligate wetland plants in saturated zone

10. Existing Functionality

High	Moderate	Low
Functioning at Risk (FAR) with a downward or no apparent trend	NA	Proper Functioning Condition (PFC) or Functioning at Risk (FAR) with an upward trend (Non-functional systems could be high or low depending on values and importance)
Rating: HIGH		
Comment: FAR with a downward trend due to headcut		

Summary

Management Priority

High	
Moderate	X
Low	

Restoration Priority

High	X
Moderate	
Low	

Rationale for Rating:

Tin Creek meadows are located at the head of the Tin Creek drainage. The wetland is likely being drained due to surface and subsurface flows being channeled. A moderate sized headcut occurs near the bottom of the wet meadow which places the upslope wetland at risk. Grazing management records show that this site does not experience grazing in excess of annual allowable use criteria (50% forage use of herbaceous plants). The existing wetland extent and community condition are the result of the headcut and subsequent lowering of the water table. The site was given a *moderate management priority* rating after considering the criteria responses and the need for proper management in the future to ensure the success of restoration efforts.

Because the site has several high values (Jurisdictional Wetland potential, is tributary to a perennial stream, is perennial), has the potential for improved community conditions, and was rated functional at risk with a downward trend due to the headcut, it is a *high restoration priority*.

Management, Restoration, and Monitoring Direction:

- > Install control structure on headcut to protect upslope wetland as soon as possible.
- Continue monitoring to ensure annual grazing indicator standards are not exceeded (stubble height, willow use, trampling) and revise management and monitoring as necessary.
- Explore alternatives to distribute livestock if annual indicators are exceeded after restoration efforts are completed in the future.

Appendix A: Jurisdictional Wetlands

Jurisdictional Wetlands are those wet areas protected by law through section 404 of the Clean Water Act and the Food Security Act. The US Army Corps of Engineers (Federal Register 1982) and the Environmental Protection Agency (Federal Register 1980) jointly define wetlands as:

"Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

Furthermore:

- "Wetlands have the following general diagnostic environmental characteristics:
 - 1) **Vegetation**. The prevalent vegetation consists of macrophytes that are typically adapted to areas having hydrologic and soil conditions described above. Hydrophytic species, due to morphological, physiological, and/or reproductive adaptation(s), have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions.
 - 2) Soil. Soils are present and have been classified as hydric, or they possess characteristics that are associated with reducing soil conditions.
 - 3) **Hydrology.** The area is inundated either permanently or periodically at mean water depths ≤ 6.6 ft, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation."

In addition to the above criteria, for a wetland to be considered Jurisdictional, it must also have a connection to a *Traditionally Navigable Water* (TNW). While the definitions of a wetland are fairly straightforward, whether or not a wetland is jurisdictional under the Clean Water Act is not. Jurisdictional definitions have gone through a number of legal challenges and those definitions have been refined and revised through agency and Court decisions and will continue to evolve. Currently, wetlands (that meet the definitions described above) that are adjacent to Traditionally Navigable Waters (TNW) or non-navigable tributaries to TNWs that have *continuous flow at least seasonally* are considered jurisdictional. For the purposes of the Lentic Area Prioritization Guide, if there is a question as to the lentic area being jurisdictional or not, consider it jurisdictional and indicate that the site has a high potential for Jurisdiction wetland status. If for some reason it is important to conclusively determine if the site is jurisdictional or not, contact the Corps of Engineers.

Appendix B: Nontidal Water Regimes (Cowardin)

<u>Perennial:</u>

Permanently Flooded: Water covers the land surface throughout the year in all years. Vegetation is composed of obligate hydrophytes.

Intermittently Exposed: Surface water is present throughout the year except in years of extreme drought.

Semipermanently Flooded: Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.

<u>Intermittent:</u>

Seasonally Flooded: Surface water is present for extended periods especially early in the growing season, but is absent by the end of the season in most years. When surface water is absent, the water table is often near the land surface.

Saturated: The substrate is saturated to the surface for extended periods during the growing season, but surface water is seldom present.

Ephemeral:

Temporarily Flooded: Surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the season. Plants that grow both in uplands and wetlands are characteristic of the temporarily flooded regime.

Intermittently Flooded: The substrate is usually exposed, but surface water is present for variable periods without detectable seasonal periodicity. Weeks, months, or even years may intervene between periods of inundation. The dominant plant communities under this regime may change as soil moisture conditions change. Some areas exhibiting this regime do not fall within our definition of wetland because they do not have hydric soils or support hydrophytes.

Artificially Flooded: The amount and duration of flooding is controlled by means of pumps or siphons in combination with dikes or dams. The vegetation growing on these areas cannot be considered a reliable indicator of water regime. Examples of artificially flooded wetlands are some agricultural lands managed under a rice-soybean rotation, and wildlife management areas where forests, crops, or pioneer plants may be flooded or dewatered to attract wetland wildlife. Neither wetlands within or resulting from leakage from man-made impoundments, nor irrigated pasture lands supplied by diversion ditches or artesian wells, are included under this modifier.

Appendix C: Access Database Structure

FIELD	DATA TYPE	CONTENTS
Site Number*	Text	A unique identifier given - use this to link to access data
BLM District	Text	District Office
BLM Field Office	Text	Field Office
Site Name	Text	Name of lentic site
Allotment	Text	Grazing Allotment
Evaluators	Text	Names of evaluators
Year Evaluated	Date	Year Evaluated
Management Priority	Text	Code: $(H = High, M = Moderate, L = Low)$
Restoration Priority	Text	Code: $(H = High, M = Moderate, L = Low)$
Wetland Type 1**	Text	Code: (SPR/S = Spring/Seep, WM = Wet Meadow, MM = Mesic Meadow, RES = Reservoir, SMRES = Small Reservoir, LAKE = Lake, SMLAKE = Pothole or Small Mountain Lake)
Wetland Type 2**	Text	Code: (SPR/S = Spring/Seep, WM = Wet Meadow, MM = Mesic Meadow, RES = Reservoir, SMRES = Small Reservoir, LAKE = Lake, SMLAKE = Pothole or Small Mountain Lake)
Wetland Type 3**	Text	Code: (SPR/S = Spring/Seep, WM = Wet Meadow, MM = Mesic Meadow, RES = Reservoir, SMRES = Small Reservoir, LAKE = Lake, SMLAKE = Pothole or Small Mountain Lake)
Jurisdictional Wetland Status	Text	Code: $(H = High, L = Low)$
Tributary Status	Text	Code: $(H = High, L = Low)$
TES Species Values	Text	Code: (H = High, M = Moderate, $L = Low$)
Existing Wetland Extent	Text	Code: $(H = High, M = Moderate, L = Low)$
Existing Hydric Permanence	Text	Code: (H = High, M = Moderate, $L = Low$)
Existing Community Condition	Text	Code: (H = High, M = Moderate, L = Low)
Potential Wetland Extent	Text	Code: $(H = High, M = Moderate, L = Low)$
Potential Hydric Permanence	Text	Code: $(H = High, M = Moderate, L = Low)$
Potential Community Condition	Text	Code: (H = High, M = Moderate, L = Low)
Existing Functionality	Text	Code: $(H = High, L = Low)$
UTMD	Text	UTM Datum
UTMZ	Number	UTM Zone
UTMN	Number	UTM Northerly
UTME	Number	UTM Easterly
Evaluation Forms	Text	This is a hyperlink to the ID Form & Evaluation Form

* This is the primary key used to link to other data/tables including the evaluation form and the identification form.

** There are three wetland type fields for recording multiple types that occur on the same site.

REFERENCES

Cowardin, L.M., V. Carter, F. Golet, and E. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. USDI, FWS/OBS-79/31, Washington, DC. 103 pp.

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