

**MITIGATION BANK INSTRUMENT**

**FOR**

**MUD SLOUGH WETLAND MITIGATION BANK  
PHASE 3**

**PRESENTED TO:**

U.S. Army Corps of Engineers, Portland District (Corps)  
Oregon Department of State Lands (DSL)  
U.S. Environmental Protection Agency (EPA)  
U.S. Fish and Wildlife Service (USFWS)  
Oregon Department of Environmental Quality (DEQ)  
Oregon Department of Fish and Wildlife (ODFW)

Prepared by:

Ridgeline Resource Planning

JUNE 2008

**MITIGATION BANK INSTRUMENT  
FOR  
PHASE 3 of the MUD SLOUGH WETLAND MITIGATION BANK**

This Mitigation Bank Instrument (MBI), which describes the establishment, use, operation, and maintenance of Phase 3 of the Mud Slough Wetland Mitigation Bank (Bank) is an agreement made and entered into by and among Mark Knaupp (Sponsor), the U.S. Army Corps of Engineers, Portland District (Corps), the Oregon Department of State Lands (DSL), the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (USFWS), the Oregon Department of Environmental Quality (DEQ), and the Oregon Department of Fish and Wildlife (ODFW).

**I. PREAMBLE:**

A. Purpose: Whereas, the purpose of this MBI is to establish guidelines, responsibilities, and standards for the establishment, use, operation, and maintenance of the Bank. The Bank will be used for compensatory mitigation for unavoidable impacts to waters of the United States or waters of the State including wetlands that result from activities authorized under Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act and Oregon's Removal-Fill Law [Oregon Revised Statutes (ORS) 196.800-196.990 and Oregon Administrative Rule (OAR) 141-085] and for impacts from other activities as the co-chairs may authorize provided that such activities have met all applicable requirements and are authorized by the appropriate authority.

B. Goals and Objectives:. Whereas, the primary goal(s) of the Bank are to enhance 80.0 acres of cropped wetlands to emergent and wet prairie and restore approximately 1.5 acres of upland to wet prairie habitat. The total acreage of Phase 3 is 81.5 acres. The actual acreages were determined after the as-built survey

C. Location and Ownership of Parcel: (1) Whereas, the Sponsor has provided proof of ownership of the mitigation bank site at the legal description described in Exhibit A of this MBI, and as depicted on a plan dated December 15, 2007 (Exhibit B). Said parcels are hereinafter referred to as the "Property." (2) The Sponsor has not proposed additional phases; therefore, any additional phases of this bank require a modification to the MBI. (3) The Property is located in Polk County, Township 7S, Range 4W, Sections 20, Tax Lot 300. Phase 3 of the Bank is only a portion (81.5 acres) of the 413 acre tax lot. The address of the Bank is 1875 N. Greenwood Road, in the City of Rickreall, Oregon.

D. Establishment and Use of Credits: Whereas, in accordance with the provisions of this MBI and upon satisfaction of the performance standards contained in the Mitigation Plan (MP) (Exhibit C), mitigation credits determined in accordance with the Instrument (Exhibit C) will be available to be used as mitigation in accordance with all applicable requirements for permits issued under Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act and Oregon's Removal-Fill Law [Oregon Revised Statutes (ORS) 196.800-196.990]. The final number of credits will be determined by the MBRT based upon the final approved design and the resulting habitats achieved for each phase of the Bank in accordance with the terms and conditions contained herein.

Modified November, 2008

E. Mitigation Bank Review Team: Whereas, the Mitigation Banking Review Team (MBRT) consists of:

1. U.S. Army Corps of Engineers, Co-Chair; and
2. Oregon Department of State Lands, Co-Chair; and
3. Environmental Protection Agency; and
4. U.S. Fish and Wildlife Service; and
5. Oregon Department of Environmental Quality; and
6. Oregon Department of Fish and Wildlife;

H. Disclaimer: Whereas, this MBI does not in any manner affect statutory authorities and responsibilities of the signatory parties.

I. Exhibits: Whereas, the following Exhibits are incorporated by reference to this MBI:

1. "Exhibit A," Legal Property Description/Proof of Ownership and Vicinity Map
2. "Exhibit B," Proposed Site Plan (drawing);
3. "Exhibit C," Mitigation Plan;
4. "Exhibit D," Crediting and Debiting Procedure for the Bank;
5. "Exhibit E," Service Area Map;
6. "Exhibit F," Restrictive Covenant;
7. "Exhibit G" Statement of Sale of Credit for Mud Slough Wetland Mitigation Bank;
8. "Exhibit H" Credit ledger;
9. "Exhibit I" Long Term Endowment Agreement –Letter of Intent

NOW, THEREFORE, the parties hereto agree as to the following:

## **II. DEFINITIONS\***

1. **COMPENSATORY MITIGATION** – Activities conducted by an authorization holder, permittee or third party to create, restore or enhance wetland functional attributes to compensate for the adverse effects of project development.
2. **CREATION** – (Establishment) To convert an area that has never been a wetland to a jurisdictional wetland.
3. **CREDIT** – A unit of measure of the increase in wetland functional attributes achieved at a mitigation bank site. Wetland credits are the unit of exchange for compensatory mitigation. ORS 196.600(2) further defines this term.

4. DEBIT – A unit of measure representing the reduction of credits at the mitigation bank corresponding to the impact at the project site.
5. ENHANCEMENT – Human activity that increases the function of an existing degraded wetland.
6. FINANCIAL ASSURANCES – The money or other form of financial instrument (for example, surety bonds, trust funds, escrow accounts, proof of stable revenue sources for public agencies) required of the sponsor BY DSL to ensure that the functions of the subject bank are achieved and maintained over the long-term pursuant to the terms and conditions of the Instrument. DSL does not require financial assurances from banks sponsored by governmental entities.
7. FUNCTIONS – The physical, chemical, and biological ecosystem processes of an aquatic resource without regard to their importance to society.
8. INSTRUMENT- The legally binding and enforceable agreement between the Director of DSL, the District Engineer of the Corps, and a mitigation bank sponsor that formally establishes the wetland mitigation bank and stipulates the terms and conditions of its construction, operation, and long-term management.
9. LEDGER – An accounting sheet including all credits released to and debits withdrawn from the bank which includes a running, cumulative balance.
10. MITIGATION BANK – Wetland(s) and any associated buffer(s) restored, enhanced, created, or protected, whose credits may be sold or exchanged to compensate for unavoidable future wetland losses due to removal, fill, or alteration activities.
11. MITIGATION BANK INSTRUMENT (MBI) – The legally binding and enforceable agreement between the Director of DSL, the District Engineer of the Corps, and a mitigation bank sponsor that formally establishes the wetland mitigation bank and stipulates the terms and conditions of its construction, operation, and long-term management.
12. MITIGATION BANK REVIEW TEAM (MBRT) – An advisory committee to the DSL and the Corps on wetland mitigation banks. An interagency group of federal, state, tribal, and/or local regulatory and resource agency representatives which are signatories to an MBI. The Corps and DSL are the co-chair's of the MBRT and the final decision makers.
13. MITIGATION SITE PLAN – A detailed drawing that identifies specifically where aquatic resources and associated upland buffers will be restored, created, enhanced, or preserved on the mitigation bank.
14. PERFORMANCE STANDARDS– observable or measurable attributes that are used to determine if a compensatory mitigation project meets its objectives.



15. **PRESERVATION** – The protection of ecologically important aquatic resources in perpetuity through the implementation of appropriate legal and physical mechanisms. Preservation may include protection of upland areas adjacent to wetlands or other aquatic resources as necessary to ensure protection and/or enhancement of the aquatic ecosystem.
16. **RESTORATION** – Re-establishment of wetland hydrology to a former wetland sufficient to support wetland characteristics.
17. **SERVICE AREA** – The boundaries set forth in a MBI that include one or more watersheds identified on the United States Geological Survey, Hydrological Unit Map 1794, State of Oregon, for which a mitigation bank provides credits to compensate for adverse effects to waters of the United States from project development. Service areas for mitigation banks are not mutually exclusive.
18. **SPONSOR** – A person who is proposing, or has established and/or is maintaining a mitigation bank. The sponsor is the entity that assumes all legal responsibilities for carrying out the terms of the MBI, unless specified otherwise explicitly in the MBI.
19. **STEWARD** – An entity, such as a land trust or local government, with the mission and capacity to provide ongoing management of a bank site as a natural area to sustain wetland functions in perpetuity.

\* Derived from:

Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks (FR V. 60 No. 228, November 28, 1995);

Cowardin, L.M. et al. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U. S. Fish and Wildlife Service, Office of Biological Services. Washington, D.C. FWS/OBS-79/31. 131 pp; and Oregon Revised Statutes ORS 196.600 et seq., Oregon Administrative Rules 141-085.

### **III. AUTHORITIES**

The establishment, use, operation and maintenance of the Bank is carried out in accordance with the following authorities:

#### **A. Federal:**

1. Clean Water Act (33 USC 1251 et seq.);
2. Rivers and Harbors Act (33 USC 403);
3. Fish and Wildlife Coordination Act (16 USC 661 et seq.);
4. Regulatory Programs of the Corps of Engineers, Final Rule (33 CFR Parts 320-330);
5. Guidelines for Specification of Disposal Sites for Dredged and Fill Material (40 CFR Part 230);
6. Memorandum of Agreement between the Environmental Protection Agency and the

Department of the Army concerning the Determination of Mitigation Under Clean Water Act, Section 404 (b)(1) Guidelines (February 6, 1990);

7. Federal Guidance for the Establishment, Use, Operation of Mitigation Banks (60 F.R. 58605 et seq. November 28, 1995);

8. Regulatory Guidance Letter No. 02-02, U.S. Army Corps of Engineers, December 26, 2002; and

**B. State of Oregon:**

1. Oregon Administrative Rules (OAR) 141-85-0010 through 141-85-445; and
2. Oregon Revised Statutes (ORS) 196.600-196.990

**IV. ESTABLISHMENT OF THE BANK**

A. Scope of Work: The Sponsor agrees to perform all necessary work, in accordance with the provisions of this MBI, to establish and maintain aquatic habitats and upland buffers, as described in the Mitigation Plan (Exhibit C), until it is demonstrated to the satisfaction of the Agencies represented on the MBRT (acting through the co-chairs) that the project complies with all provisions contained herein, or until 5 years after all credits are sold, whichever is later. Work as described above shall include implementing the Mitigation Plan (Exhibit C). Prior to any debiting, the Bank must be approved and credits released by both co-chairs.

B. Permits: The Sponsor will obtain all appropriate permits or other authorizations needed to construct and maintain the Bank, prior to selling any credits. This MBI does not fulfill or substitute for such authorization.

C. Approval: Upon the co-chair agencies signing this MBI, the MBRT approves this MBI.

D. Financial Assurance Requirements of DSL: The bank sponsor will provide financial assurance sufficient to ensure that the functions of the subject bank are achieved and maintained over the long-term. The amount of the assurance, the conditions under which it may be implemented by DSL, and the schedule for partial releases of the assurance are described in Section IX of Exhibit C.

E. Real Estate Provisions: The Sponsor shall record a permanent legal property protection document on the Bank land. A copy of the initial recorded document shall be provided to the Corps and DSL prior to any release of credits. Prior to the final release of credits, the final conservation easement or equivalent protection mechanism shall be submitted to the MBRT for review and approval by the co-chairs.

F. Corps Authorization: For the initial release of advanced credits by the Corps (not to exceed 30% of the total number of credits available from the entire bank), the Corps authorization must be issued and activated (i.e. discharge into a water of the U.S.). The Corps will use the enforcement authority outlined in 33 CFR 326 for enforcing the success of the performance standards as necessary.

G. As-Built Report: The Sponsor agrees to submit an as-built report to the MBRT co-chairs within 60 days following completion of the grading. The as-built report will describe in detail and substantial deviation from the requirements described in the Mitigation Site Plan submitted to the MBRT co-chairs in accordance with the Instrument and the as-built report shall contain a survey showing finished grades.

## V. OPERATION OF THE BANK

A. Service Area: The Bank is established to provide mitigation to compensate for impacts to waters of the United States and/or state waters, including wetlands, within the service area depicted on the excerpt of the USGS Hydrologic Unit Map as shown in Exhibit E. This service area shall include all of the 4<sup>th</sup> field hydrologic unit 1709007 (Middle Willamette and 1709008 (Yamhill) within Polk, Marion, Yamhill and Clackamas Counties. The Bank may be used to compensate for impacts beyond the designated service area, on a case-by-case basis.

B. Access: With prior notice the Sponsor will allow, or otherwise provide for, access to the site by members of the MBRT or their agents or designees at reasonable times as necessary to conduct inspections, and compliance monitoring with respect to the requirements of this MBI. The Sponsor also will allow access to the MBRT, their agents and designees to carry out Bank remediation using funds provided through the financial assurance requirements of this MBI in the event of failure to meet Bank performance standards, in the circumstances specified in Section VI.E. of this MBI. Inspecting parties shall not unreasonably disrupt or disturb activities on the property, and will provide written notice within reasonable time prior to the inspection.

C. Projects Eligible to Use the Bank: The Sponsor will be named as the party responsible for providing mitigation once a credit is sold. All activities regulated under Section 10 of the Rivers and Harbors Act, Section 404 of the Clean Water Act, Oregon's Removal-Fill Law [Oregon Revised Statutes (ORS) 196.800-196.990] and other activities as the Corps or DSL may authorize consistent with this MBI may be eligible to use this Bank as compensatory mitigation for unavoidable impacts (some exceptions to this may be granted on a project by project basis); credits purchased may only be used in conjunction with a Corps or DSL permit authorization, to resolve a DSL violation, or in conjunction with other actions as the Corps or DSL may authorize.

D. Number of Credits: Credits and debits will be assessed using measurements of the area and/or functions of impacts and the mitigation land area and/or functions. The number of credits expected to be generated by development of this Bank may later be adjusted upwards or downwards, as determined by the co-chairs, following the same relationship between land area, functions, and ratios. The amount to be debited for each impact will depend upon the area and/or functions of wetlands or waters to be impacted as determined during the permitting process by the respective regulatory agency.

E. Performance Standards: Credits will be released, as described in Exhibit D, based on the achievement of performance standards. The performance standards are detailed in the Mitigation Plan (Exhibit C).

F. Party Responsible for Mitigation: The Sponsor will be responsible party for fulfilling the mitigation requirements of the permits credits are sold to.

G. Bonus Credit Establishment T&E Species: The Sponsor will be allowed to petition the MBRT for additional bonus credits should the sponsor use the Bank as a recovery site for Threatened and Endangered (T&E) Species. If the Sponsor proceeds with T&E recovery actions and does so to the satisfaction of the USFWS, the sponsor will present to the MBRT his proposal for bonus credits. Specifics as to credit ratios and amount of credits generated by T&E recovery actions will be negotiated to the satisfactory agreement of the MBRT and the Sponsor. Since these bonus credits are anticipated at the time this MBI is developed, and signed, this will not be considered a modification (as described in 33 CFR 332.8) which would require a whole new MBI.

H. Bonus Credit Language: The Sponsor will be allowed to petition the MBRT for bonus credits as soon as the MBRT has approved a functional assessment tool that will adequately measure the rise in wetland functions due to activities/changes related to the creation of the Bank.

## **VI. MAINTENANCE AND MONITORING OF THE BANK**

A. Maintenance Provisions: The Sponsor agrees to perform all reasonably necessary work to maintain the Bank consistent with the Mitigation Plan (Exhibit C). The Sponsor shall continue with such maintenance activities until completion of the monitoring period described in Section VI.B or until the Bank is transferred to an approved long-term steward. Deviation from the approved MBI is subject to review and written approval by the co-chairs.

B. Monitoring Provisions: The Sponsor agrees to perform all necessary work to monitor the Bank to demonstrate achievement of the performance standards established in the Mitigation Plan. The details of the monitoring provisions are described in the Mitigation Plan (Exhibit C).

C. Accounting Procedure: The Sponsor shall submit a statement (copy of the receipt) to the Corps and DSL each time credits are sold. A sample of this statement is attached as Exhibit G. In addition, the Sponsor shall submit a ledger to the Corps and DSL by January 31, annually, for distribution to all members of the MBRT, showing all credit releases, sales, and suspensions at the Bank for the previous calendar year and a cumulative tabulation of all transactions to date (a sample Credit Ledger is included with this document as Exhibit H). Ledgers and copies credit sale of receipts shall be submitted to the MBRT until the last credit is sold.

D. Contingency Plans/Remedial Actions: The Mitigation Plan (Exhibit C) includes a detailed contingency plan describing how project deficiencies or performance failures will be corrected when identified. In the event that an inspection of the Bank site reveals a disparity between actual performance and credits already released, the co-chairs may immediately suspend further credit sales. In the event the Sponsor fails to implement necessary remedial actions within one growing season after notification by the Corps and/or DSL, the co-chairs may begin implementing appropriate remedial actions including the use of financial assurance to operate the

Bank. The Corps and DSL may implement their respective agencies enforcement authorities over the permit issued for the Bank at any time.

E. Default: Should the co-chairs determine that the Sponsor is in material default of any provision of this MBI, the co-chairs shall notify the Sponsor that the sale or transfer of any credits will be suspended until the claimed deficiencies have been remedied. Upon notice of such suspension, the Sponsor agrees to immediately cease all sales or transfers of mitigation credits until the Corps and DSL inform the Sponsor that sales or transfers may be resumed. Should the Sponsor remain in default, the MBRT, acting through the Corps and DSL, may terminate the MBI and any subsequent Bank operations. Upon termination, the Sponsor agrees to perform and fulfill all obligations under this MBI relating to credits that were sold or transferred prior to termination.

F. Bank Closure: At the end of the monitoring period, upon satisfaction of the performance standards, the Corps and DSL shall issue a written "bank closure certification" to the Sponsor. DSL will notify the financial security holder, and thereafter any remaining requirement for financial assurances will cease. The Sponsor may be allowed to utilize any portion of the Bank lands that have not had mitigation credits debited from them, provided such utilization does not adversely affect the goals of the Bank.

G. Long-Term Ownership and Preservation: The Sponsor will be responsible for long-term stewardship of the Bank after the active monitoring period has ended and the Bank has been closed as described in Section IV F. The steward shall be responsible for managing the Bank in perpetuity in accordance with the terms of the restrictive covenant and conservation easement described in Section IV E.

## **VII. RESPONSIBILITIES OF THE MITIGATION BANK REVIEW TEAM**

A. The agencies represented on the MBRT agree to provide appropriate oversight in carrying out provisions of this MBI through the co-chairs.

B. The agencies represented on the MBRT agree to review and provide comments on all project plans, annual monitoring reports, credit release requests, remediation plans, and site inspections for the Bank. Comments, if any, will be submitted within a specified time frame. If comments from the MBRT agencies are not received within the time required, those comments may not be considered.

C. Any member of the MBRT may elevate a dispute as described in the Federal Mitigation Rule.

## **VIII. OTHER PROVISIONS**

A. Force Majeure: The Sponsor will not be responsible for Bank failure that is attributed to natural catastrophes such as flood, drought, disease, or regional pest infestation, that the co-chairs, determines is beyond the reasonable control of the Sponsor to prevent or mitigate.

B. Dispute Resolution: Resolution of disputes concerning the signatories' compliance with this MBI, including the determinations they make as specified in this MBI shall be in accordance with those stated in the Final Mitigation Disputes related to satisfaction of performance standards may be referred to an independent review from government agencies or academia that are not part of the MBRT. The MBRT will evaluate any such input and determine whether the performance standards have been met. Appeals of any DSL decisions shall be processed according to OAR 141-085-0075.

C. Validity and Termination of the MBI: This MBI will become valid on the latter date of the representative of the Corps or DSL signs this MBI. This agreement may be terminated upon written approval from the co-chairs and Sponsor. Upon termination of this agreement, for any reason, the Sponsor remains liable for any mitigation credits that have been sold to satisfy mitigation responsibilities of permittees.

D. Specific Language of MBI Shall Be Controlling: To the extent that specific language in this document changes, modifies, or deletes terms and conditions contained in those documents that are incorporated into the MBI by reference, and that are not independently legally binding. The specific language within this MBI shall be controlling.

E. Notice: Any notice required or permitted hereunder shall be deemed to have been given either (i) when delivered by hand, or (ii) three (3) days following the date deposited in the United States mail, postage prepaid, by registered or certified mail, return receipt requested, or (iii) sent by Federal Express or similar next day nationwide delivery system, addressed as follows (or addressed in such other manner as the party being notified shall have requested by written notice to the other party):

Mark Knaupp  
1875 N. Greenwood Road  
Rickreall, Oregon 97371

U.S. Army Corps of Engineers  
CENWP-OD-G Policy Specialist  
P.O. Box 2946  
Portland Oregon 97208-2946

Oregon Department of State Lands  
775 Summer Street NE, Suite 100  
Salem, Oregon 97301-1279

F. Entire MBI: This MBI constitutes the entire agreement between the parties concerning the subject matter hereof and supersedes all prior agreements or undertakings. There are no undertakings, agreements, or representatives, oral or written, not specified herein regarding this MBI. No waiver, consent, modification or change of terms of this MBI shall bind either party unless in writing and signed by co-chairs and Sponsor, and all necessary approvals have been obtained. Such waiver, consent, modifications, or change, if made shall be effective only in the

specific instance and for the specific purpose given. The failure of any party to enforce any provision of this MBI shall constitute a waiver by that party of that or any other provision.

G. Modification: This MBI may not be modified except by the written agreement of the DSL, Corps and the Sponsor. In the event the Sponsor determines that modifications must be made in the Mitigation Plan to ensure successful establishment of habitat within the Bank, the Sponsor shall submit a written request for such modification to the co-chairs, for approval. The co-chairs will distribute this request to the MBRT to seek their recommendations. The MBRT agrees to not unreasonably withhold or delay such approval. Documentation of implemented modifications shall be made consistent with this MBI.

H. Invalid Provisions: In the event any one or more of the provisions contained in this MBI are held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability will not affect any other provisions hereof, and this MBI shall be construed as if such invalid, illegal or unenforceable provision had not been contained herein.

I. Headings and Captions: Any paragraph heading or captions contained in this MBI shall be for convenience of reference only and shall not affect the construction or interpretation of any provisions of this MBI.

J. Counterparts: This MBI may be executed by the parties in any combination, in one or more counterparts, all of which together shall constitute but one and the same instrument.

K. Binding: This MBI shall be immediately, automatically, and irrevocably binding upon the Sponsor and its heirs, successors, assigns and legal representatives upon signing by the Sponsor, the Corps, and DSL even though it may not, at that time or in the future, be executed by the other potential parties to this MBI. The signing of this MBI by EPA, DEQ, ODFW, or the USFWS, or other agency, city or county shall cause the signing agency to become a party to this MBI upon signing, even though all or any of the other potential parties have not signed the MBI.

L. Liability of Regulatory Agencies: The responsibility for financial success and risk to the investment initiated by the Sponsor rests solely with the Sponsor. The regulatory agencies (Corps and DSL) that are parties to this MBI administer their regulatory programs to best protect and serve the public's interest in its wetlands and waterways, and not to guarantee the financial success of mitigation banks, specific individuals, or entities. Accordingly, there is no guarantee of profitability for any individual mitigation bank. Sponsors should not construe this MBI as a guarantee in any way that the regulatory agencies will ensure sale of credits from this Bank or that the regulatory agencies will forgo other mitigation options that may also serve the public interest. Since the regulatory agencies do not control the number of mitigation banks proposed or the resulting market impacts upon success or failure of individual banks, in depth market studies of the potential and future demand for bank credits are the sole responsibility of the sponsor.

M. Grant Program Participation: According to the Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks (Guidance) published in the Federal Register on November 28, 1995 by the Corps, EPA, the Natural Resource Conservation Service, USFWS, and the

National Marine Fisheries Service, wetlands restored through the Conservation Reserve Program or similar programs cannot be used to generate credits from a mitigation bank. In accordance with the Guidance, Federally-funded wetland restoration projects cannot be used to generate credits within this mitigation bank.

N. Suspension of Credits: The co-chairs may suspend the sale of credits if new information received by the MBRT indicates information in this MBI was falsely presented or due to a breach of this MBI.

O. Sale of Bank Property: If you transfer the title of this property, you must notify the Corps and DSL in writing prior to the transfer of your property.

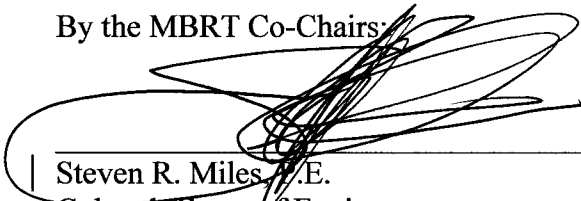
IN WITNESS WHEREOF, the parties hereto have executed this MBI on the date herein below last written by the Co-Chairs.

  
\_\_\_\_\_  
Mark Knaupp, sponsor


6-27-08  
Date

MITIGATION BANK REVIEW TEAM

By the MBRT Co-Chairs:

  
\_\_\_\_\_  
Steven R. Miles, U.S. Army  
Colonel, Corps of Engineers  
District Commander

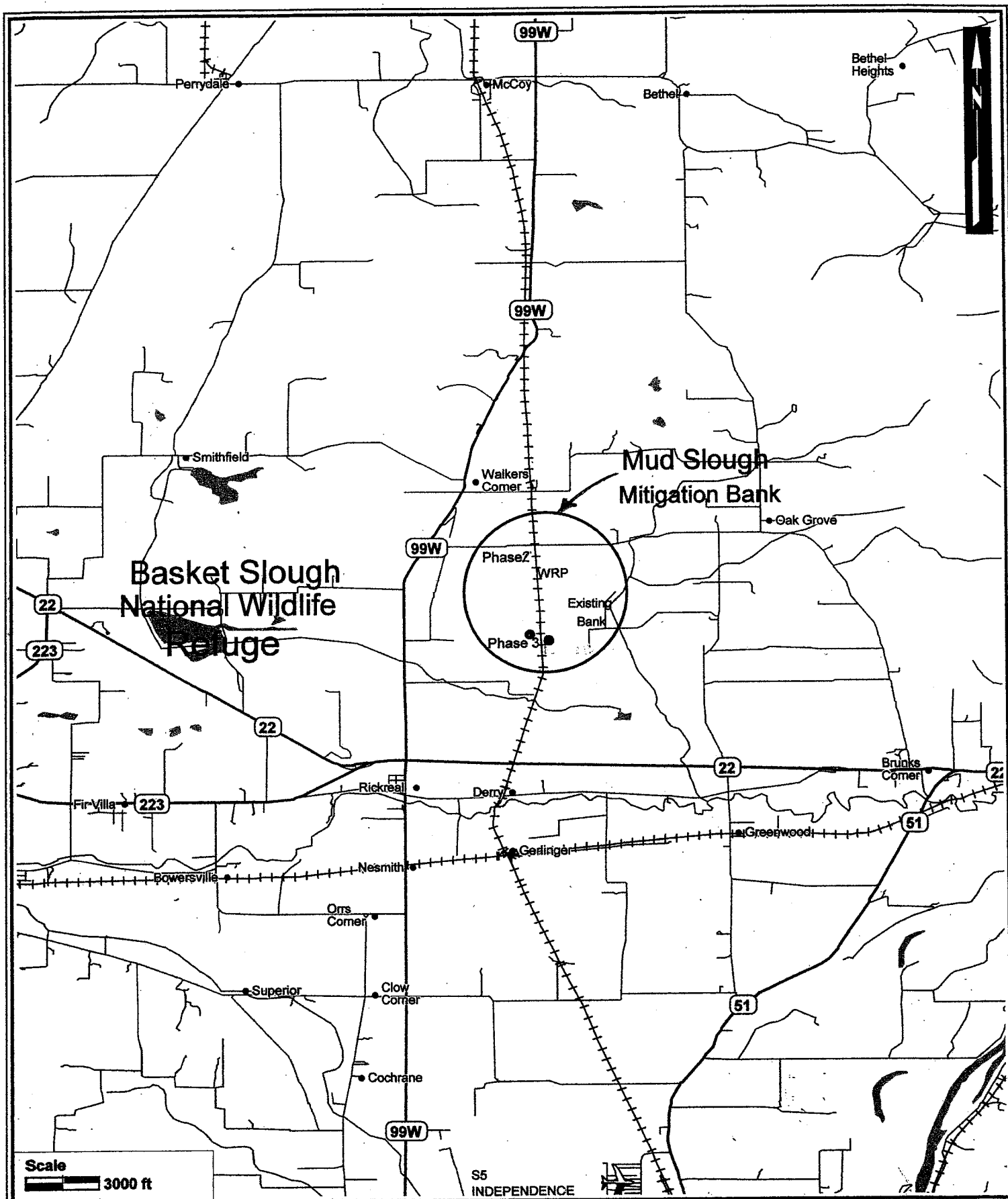
8 July 2008  
Date

  
\_\_\_\_\_  
Louise Solliday, Director  
Oregon Department of State Lands

7/8/08  
Date



# Mud Slough Wetlands



**REAL PROPERTY TAX STATEMENT**

JULY 1, 2007 TO JUNE 30, 2008

POLK COUNTY, OREGON

850 MAIN STREET

DALLAS, OREGON 97338-3184

ACCOUNT NO: 157052
-----------------------

**PROPERTY DESCRIPTION**

**CODE:** 0204  
**MAP:** 074200000300  
**ACRES:** 413.45

KNAUPP MARK A & KNAUPP MARK  
1875 NORTH GREENWOOD RD  
RICKREALL, OR 97371

CHEMEKETA COMMUNITY COLLEGE	141.03
WILLAMETTE ESD	66.85
DALLAS SD 2	1,025.81
<b>EDUCATION TOTAL:</b>	<b>1,233.69</b>

POLK COUNTY	386.65
CHEMEKETA REGIONAL LIBRARY	18.43
SOUTHWEST RFPD	194.04
DALLAS CD	12.32
POLK SOIL/WATER CD	11.27
<b>GENERAL GOVT TOTAL:</b>	<b>622.71</b>

POLK COUNTY BONDS AFTER 2001	155.02
CHEMEKETA COMMUNITY COLLEGE	16.38
SOUTHWEST RFPD	46.55
DALLAS SD 2	377.05
<b>BONDS - OTHER TOTAL:</b>	<b>595.00</b>

VALUES:	LAST YEAR	THIS YEAR
<b>REAL MARKET (RMV)</b>		
LAND	1,143,450	1,347,630
STRUCTURES	1,770	1,770
<b>TOTAL RMV</b>	<b>1,145,220</b>	<b>1,349,400</b>
<b>TOTAL ASSESSED VALUE</b>	<b>218,765</b>	<b>225,319</b>
<b>EXEMPTIONS</b>		
<b>NET TAXABLE:</b>	<b>218,765</b>	<b>225,319</b>
<b>TOTAL PROPERTY TAX:</b>	<b>2,371.06</b>	<b>2,451.40</b>

POTENTIAL ADDITIONAL TAX LIABILITY	
ASSESSMENT QUESTIONS	(503) 623-8391
TAX QUESTIONS	(503) 623-9264

**2007-08 TAX ( Before Discount )** 2,451.40

PAYMENT OPTIONS			
Date Due	3% Option	2% Option	Trimester Option
11/15/07	2,377.86	1,601.58	817.13
02/15/08			817.14
05/15/08		817.13	817.13
<b>Total</b>	<b>2,377.86</b>	<b>2,418.71</b>	<b>2,451.40</b>

**TOTAL DUE ( After Discount and Pre-payments)** 2,377.86



# Mud Slough Wetland Mitigation Bank

1875 N. Greenwood Road  
Rickreall, Oregon

## **Exhibit C** **Phase 3 Mitigation Plan** **FINAL**

by

Ridgeline Resource Planning

April 2008  
Updated June 2008

## TABLE OF CONTENTS

<b>I.0 BANK GOALS AND OBJECTIVES .....</b>	<b>1</b>
<b>II.0 BASELINE INFORMATION .....</b>	<b>1</b>
A. Location.....	1
B. Classification.....	1
C. Quantify Wetland Resources.....	2
D. Existing Hydrology .....	2
E. Existing Vegetation .....	2
F. Existing Soils .....	3
G. Existing Wildlife Usage.....	3
H. Historic and Current Land Use.....	3
I. Current Owner .....	3
J. Watershed Context .....	4
K. Buffers.....	4
<b>III.0 MITIGATION SITE SELECTION AND JUSTIFICATION .....</b>	<b>4</b>
A. Site-Specific Objectives .....	4
B. Watershed/Regional Objectives .....	4
C. Sustain/Protect Existing Watershed Functions .....	5
D. Future Land use Compatibility.....	6
E. Design Sustainability .....	6
F. Species Assessment .....	6
G. SHPO/Tribal Resource Survey.....	6
<b>IV.0 MITIGATION WORK PLAN .....</b>	<b>6</b>
A. Construction Schedule .....	6
B. Proposed Hydrology .....	7
C. Proposed Vegetation.....	8
D. Proposed Habitat Features.....	8
E. Planned Buffer .....	9
F. Reference Site Baseline Information .....	9
<b>V. PERFORMANCE STANDARDS .....</b>	<b>9</b>
A. Emergent Herbaceous .....	10
B. Wetgrass Prairie .....	10
C. Overstory and Scrub-Shrub .....	10
D. Hydrology.....	10
<b>VI. SITE MAINTENANCE .....</b>	<b>11</b>
<b>VII. MONITORING PLAN.....</b>	<b>12</b>
<b>VIII. ADAPTIVE MANAGEMENT PLAN.....</b>	<b>13</b>
<b>IX. FINANCIAL ASSURANCES.....</b>	<b>13</b>
<b>X. ENDOWMENT, LONG TERM STEWARD AND MAINTENANCE .....</b>	<b>15</b>

## LIST OF FIGURES

Figure 1 – Site Map with Delineation  
Figure 2 – Vicinity Map  
Figure 3 – Watershed Map

Figure 4 – NWI Map  
Figure 5 – NRCS Map  
Figure 6 – Connectivity Map

## **LIST OF ATTACHMENTS, EXHIBITS**

Attachment A – Aerial Photos  
Attachment B – Existing Site Photos  
Attachment C – Function and Value Assessment  
Exhibit B Map – Site Plan Map

## **LIST OF TABLES**

Table 1 – Soils Summary  
Table 2 – Pre Assessment  
Table 3 - 10 Years Post Assessment  
Table 4 - Phase 3 Planting Plan  
Table 5 - Projected Costs  
Table 6 - Bond Release Schedule

## **I. BANK GOALS AND OBJECTIVES**

The primary goal of Phase 3 is to enhance approximately 80.0 acres of cropped wetlands and restore 1.5 acres of upland (drained hydric soils) to palustrine emergent, forested and scrub/shrub, and wet prairie with only limited topographic relief. Phase 3 will join the adjacent 445 acres of wetlands owned by the sponsor and perform a variety of wetland functions, foremost being wildlife habitat and plant diversity, both of which the sponsor has already achieved with extreme success in the adjacent wetlands. Phase 3 will also provide on-site storage of precipitation. The wetlands will capture and retain precipitation, off-setting the effects of the existing manmade drainage surrounding the area. The manmade drainage promotes fast drainage which contributes to the flood conditions on Rickreall Creek and decreases groundwater recharge. Precipitation, groundwater, and site surface water flows will be allowed to remain on-site within the enhanced wetland areas where they will accumulate and create a seasonally saturated and inundated wetland. These areas will hold water, increasing the retention time thereby allowing the vegetation and soils to interact with any possible nutrients they might contain in order to act as a filtration system.

## **II. BASELINE INFORMATION - BANK SITE**

### **A. Location**

1. Mud Slough Wetland Mitigation Bank (Bank) was approved in 2000, and Phase 2 in 2004. Phase 3 is located southwest of the existing Bank on the Knaupp farm. The location is approximately one and one-half miles north of Highway 22 and four miles west of Salem, Oregon in T7S, R4W, Sec. 20, Tax Lot 300 (Figure 1). The site address is 1875 N. Greenwood Road, Rickreall, OR 97371. Phase 3 is located at latitude 44° 57' 33" and longitude 123° 12' 44' 46".
2. Maps
  - a. Figure 1 – Site Map with Delineation
  - b. Figure 2 – Vicinity Map
  - c. Figure 3 – Watershed Map
  - d. Figure 4 – NWI Map
  - e. Figure 5 – NRCS Map
  - f. Exhibit B Map – Site Plan Map
  - g. Figure 6 – Map showing connectivity to water of the US
3. Attachment A – Aerial Photos
4. Attachment B – Existing Site Photos
5. Attachment C – Function and Value Assessment

### **B. Classification**

There are no wetlands listed on the Rickreall Quadrangle, National Wetlands Inventory map in Phase 3. The entire Phase 3 has received a determination by the NRCS of prior converted wetland.

### **C. Quantify Wetland Resources**

All but approximately 1.5 acres of the approximate 81.5 acres in Phase 3 qualifies as cropped wetland. The remaining 1.5 acres is drained hydric soils that qualify as upland.

#### **D. Existing Hydrology**

Phase 3 is located in the broad lowland alluvial terrace of Rickreall Creek, a principal tributary of the Willamette River. The topography of the surrounding area consists of lowland plains separated by rolling hills. Movement of unconfined ground water moves from the topographically higher hills toward the lowlands where the water is discharged as seeps, springs or to surface water bodies. According to the U.S. Geological Survey publication, *Groundwater Resources of the Dallas-Monmouth Area*, the older alluvium in the area of the Bank contain no sand or gravel layers, primarily just silt and clays. This partially explains the ponding and lack of infiltration in the area of the Bank. With no underlying gravel and sand deposits, the tighter silts and clay (e.g. Bashaw soil) holds the moisture for a longer period than would otherwise be expected, if sand and gravel layers underlain the area.

Most of the stream flow in this area occurs during the winter and spring coinciding with the majority of the area's precipitation. The groundwater in the alluvial deposits of this area is recharged seasonally, directly or indirectly by precipitation, where the soil adsorbs the water and it percolates downward to the underlying saturated zones.

Phase 3 drains to Homes Gap Ditch, a manmade drainage ditch, constructed in the 1930's and was re-excavated in 1981. It drains into Mud Slough which is a natural drainage flowing into Baskett Slough. Baskett Slough is a tributary to Rickreall Creek, which is a tributary to the Willamette River.

Phase 3 is existing agricultural land that has some poorly functioning drainage tile, perimeter and some interior ditching to increase drainage. Even with the tile and ditching, most of the site still meets the hydrology criteria for jurisdictional wetland. The site has very limited seasonal ponding due to the agricultural surface drainage, but does have saturated soils during the early part of the growing season. Throughout the summer months, the site is dry.

#### **E. Existing Vegetation**

The area of Phase 3 is currently in agricultural use for tall fescue seed production.

#### **F. Existing Soils**

According to the Polk County Soil Survey the expansion areas are primarily (92%) a combination Bashaw silty clay loam (6A), Bashaw clay (7), Dayton silt loam (25), and with smaller areas of Amity silt loam (3) Helvetia silt loam (31D) and Woodburn silt loam (77A and 77C) (See Figure 3 - Soils Map).



**Table 1 – Soils Summary**

Soils	Drainage	Permeability	Runoff	Hydric/Inclusions
Bashaw silty clay loam	Poorly drained	Very slow	Very slow to ponded	Yes
Bashaw clay	Very poorly drained	Very slow	Very slow to ponded	Yes
Dayton silt loam	Poorly drained	Slow	Slow to very slow	Yes
Amity silt loam	Somewhat poorly drained	Moderately slow	Slow	Concord & Dayton
Helvetia silt loam	Moderately well drained	Moderately slow	Medium	Wet spots
Woodburn silt loam	Moderately well drained	Slow	Slow	No

**G. Existing Wildlife Usage**

The site is all agricultural grassland that is mowed, sprayed and harvested on a yearly basis. No threatened or endangered species have been noted on site.

**H. Historic and Current Land Use**

According to the General Land Office Township Plat Map, 1852 for T7S, R4W, Sec. 20, this area was a wide marshy area with a poorly defined channel passing through the middle with wet prairie on both sides. The survey indicates that the site is fed by a watershed of over 1000 acres and significant areas of shallow water were likely present late into the summer. The surveyor also noted that the low areas on the site were covered with camas (*Camassia quamash*) with little timber on-site. It is not known exactly when the area was first cultivated for agricultural use. According to Mr. Knaupp, the current owner, the site has been cultivated for at least 40 years. Prior to that, the site was probably used as pasture. The site is currently used for grass seed production.

**I. Current Owner**

The current owner is Mark Knaupp, 1875 N. Greenwood Road, Rickreall, Oregon, 97371. Mr. Knaupp's phone number is 503-623-0768.

**J. Watershed Context**

Phase 3 is located within the Rickreall Watershed. Rickreall Creek is a water quality limited stream under the Clean Water Act, Section "303D Listing". It is included due to flow modification and temperature parameters. Phase 3 help with stream flow modifications by retaining flood waters, decreasing flow velocities and allowing runoff to leave the wetland over a prolonged period of time.

The watershed is by far a majority of agricultural land with a small percentage of woodlots and farmed dwellings with associated buildings. There is a significant amount of wetlands within the watershed, due in part, to the Bank sponsor who has restored 445 acres of wetland adjacent to Phase 3.

**K. Buffers**

Phase 3 is currently surrounded on the majority of its perimeter by land owned by the Bank sponsor. A large percentage of this is wetland in the WRP program. There is an existing hedgerow along the north side of the western portion of Phase 3. This hedgerow consists of primarily of Douglas’ hawthorn (*Crataegus douglasii*) and nootka rose (*Rosa nutkana*) and separates Phase 3 from adjacent Knaupp agricultural farmland. The closest the Bank is to property not owned by the sponsor is an approximate 400’ long strip on the west side of the Bank. Along this 400’ strip, the Bank is separated from the adjacent property by a 20 to 32’ wide strip that is owned by the sponsor. This 20 to 30’ separation between the Bank and the adjacent property owner consists of a 12’ gravel farm lane and an approximately 8 to 20’ wide hedgerow consisting of Douglas’ hawthorn, nootka rose and black cottonwood (*Populus tricarpa*).

**III. MITIGATION SITE SELECTION AND JUSTIFICATION**

**A. Site-Specific Objectives**

The majority of Phase 3 qualifies as cropped wetland and is eligible for a mitigation ratio of 2:1. A small area (1.5) acres does not meet hydrology criteria will qualify for 1:1 restoration ratio.

<i>Approximate Acreages</i>			
<u>Acres</u>	<u>Mitigation Type</u>	<u>Credit Ratio</u>	<u>Credits Earned</u>
80.0	Enhancement of cropped wetland	2:1	40.0
<u>1.5</u>	Restoration	1:1	<u>1.5</u>
81.5	Total Site		41.5

These wetland credits will be offered in the approximate percentages of 93% - palustrine emergent and wet prairie, 4% - palustrine shrub/shrub, and 3% forested.

**B. Watershed/Regional Objectives**

Phase 3 will add additional acreage of high quality wetlands to an existing functioning wetland system which will build capacity into the system for additional wildlife habitat and plant diversity. Phase 3 wetlands will also capture and retain precipitation, offsetting the effects of the existing manmade drainage surrounding the area. Precipitation, groundwater, and site surface water flows will be allowed to remain on-site within the wetland. These areas will hold water, increasing the retention time thereby allowing the vegetation and soils to interact with any possible nutrients they might contain in order to act as a filtration system.

**C. Sustain/Protect Existing Watershed Functions**

The 81.5 acres of Phase 3 will join the 445 acres of wetland that the Sponsor has already restored and created through the NRCS Wetland Reserve Program and Phases 1 and 2 of the Mud Slough Wetland Mitigation Bank. The Sponsor has developed a native wetland of exceptional quality, diversity and size. He has taken degraded wetlands that have been manipulated and drained through agricultural practices for the last 60 years and returned them to a native wetland ecosystem that surpasses most in the Willamette Valley. This has been done through a combination of the Sponsor’s understanding of wetland ecosystems, a vision to create that environment, the tenacity and expertise to put the programs and individuals together to achieve the goals and a lot of hard work.

A function and value assessment of the site was conducted. The “pre” assessment looked at the site as it is today. The “10 years post” assessment looked at the site as it is anticipated to look and function 10 years after the site work has been completed. The post functional assessment was aided by the knowledge gained watching the development of the adjacent WRP wetlands and Phases 1 and 2 of the Bank. Phase 3 has extremely similar soils, topography, hydrology and history as the previously constructed wetlands.

Tables 2 and 3 show the calculated results for each assessment. The full function and value assessment is included in Attachment C. The tables indicate the environmental lift resulting from the Bank is substantial, with increases in 9 of the 10 function criteria. The only criteria that did not show an increase in function is breeding waterbird support as neither the “pre” nor “post” site has permanent water, a requirement for breeding waterbirds.

**Table 2 – Pre Assessment**

Function:	Calculated Function Capacity for SF sites	
	if HFR:	if LAR:
Water Storage & Delay (ws)	0.05	0.11
Sediment Stabilization & Phosphorus Retention (sp)	0.61	0.65
Nitrogen Removal (n)	0.54	0.72
Primary Production (pp)	0.37	0.53
Invertebrate Habitat Support (i)	0.41	0.41
Amphibian & Turtle Habitat (at)	0.71	0.71
Breeding Waterbird Support (bw)	0.00	0.00
Wintering & Migrating Waterbird Support (ww)	0.67	0.78
Songbird Habitat Support (sb)	0.61	0.68
Support of Characteristic Vegetation (v)	0.43	0.44

**Table 3 – 10 Years Post Assessment (anticipated)**

Function:	Calculated Function Capacity for SF sites	
	if HFR:	if LAR:
Water Storage & Delay (ws)	0.40	0.89
Sediment Stabilization & Phosphorus Retention (sp)	0.75	0.80
Nitrogen Removal (n)	0.56	0.74
Primary Production (pp)	0.53	0.70
Invertebrate Habitat Support (i)	0.52	0.52
Amphibian & Turtle Habitat (at)	0.75	0.75
Breeding Waterbird Support (bw)	0.00	0.00
Wintering & Migrating Waterbird Support (ww)	0.73	0.84
Songbird Habitat Support (sb)	0.67	0.74
Support of Characteristic Vegetation (v)	0.94	0.97

**D. Future Land use Compatibility**

See Attachment A, which is an aerial photo of the site and surrounding areas. The vast majority of the surrounding area is owned by the Bank sponsor and is located within an agricultural area that is zoned EFU (exclusive farm use) as are all of the adjacent properties.

**E. Design Sustainability**

The hydrology source for Phase 3 is through retaining the natural seasonal high surface water flows and the surface water runoff from the hills surrounding the site, which is fed by natural precipitation. No ground water rights for irrigation or stream diversions are required.

**F. Species Assessment**

Phase 3 of the Bank has been examined on many occasions and was included in the assessments for Phases 1 and 2 of the Bank. During these assessments, no threatened or endangered species were noted on the site. The site has been used for grass seed production for decades with annual herbicide applications eliminating all but the targeted agricultural crops. As a result no biological assessment was warranted.

**G. SHPO/Tribal Resource Survey**

The ACOE has completed the tribal coordination for this bank, with no additional needed information needed.

**IV. MITIGATION WORK PLAN**

**A. Construction Schedule**

Construction of Phase 3 began in fall 2007 with an initial application of herbicide. An additional application will occur during the summer 2008. The drainage tile system will be dismantled and the minor excavation work will be done in the summer of 2008 and initial seeding conducted in the fall of 2008. Phase 3 will be surveyed and as-built drawings prepared after the construction phase is completed

**B. Proposed Hydrology**

The hydrologic source for the expanded wetlands is already present; however, it is degraded by agricultural practices. Phase 3 hydrology will be accomplished by retaining the natural seasonal high surface water flows and the surface water runoff from the hills surrounding the site. This will be accomplished in two ways. The first is by removing the existing surface drain system. The tile system will also be removed and the drainage allowed to enter the site on the surface creating areas with inundation of six inches or less, which will create wet prairie to emergent transitional zones. The second method is the construction of four low berms to create shallow seasonal ponds. The berms will have a maximum height of two feet, with 10 foot wide tops with 10:1 side slopes. The average pond size created by the berms will be 0.7 acres. Overflows will be around the upper end of the dikes to avoid any erosion potential. Any excavation area will have a natural appearance with irregular boundaries and shape mimicking natural features.

Two larger (4.7 acre and 6.4 acre) areas of shallow water/emergent zones will also be created in the naturally existing lower portions of the site. These are shown on the Site Map Exhibit B. At completion, the site will have approximately 2 acres with 12 to 18 inches of water, 12 acres with 1 to 12 inches and the remaining 67.5 acres with saturated conditions.

Phase 3 is connected to existing water through a series of ditches beginning with Homes Gap Ditch, a manmade drainage ditch, constructed in the 1930's and was re-excavated in 1981. It drains into Mud Slough which is a natural drainage flowing into Baskett Slough. Baskett Slough is a tributary to Rickreall Creek, which is a tributary to the Willamette River. Phase 3 is located on both sides of a railroad. Connectivity between both sides of Phase 3 is currently and will be maintained by a culvert under the railroad grade (See Figure 6).

**C. Proposed Vegetation**

In the fall of 2008, seeding will occur in the 14.0 acres of emergent, 62.2 acres of wet prairie, 2.4 acres of forested and 2.9 acres of scrub/shrub. The site will be seeded with a mulch-seed mixture planted in a zone planting for individual species. The overstory and shrub areas will be planted in the spring of 2009, following an initial seeding in the fall of 2008 with mixture of less aggressive wetland herbaceous species. The seed blend will sort itself out into different zones by moisture tolerance and topography. The level of planned planting for this site is similar to Phase 2 of the Bank which through seeding and natural recruitment has been extremely successful. Mr. Knaupp has made it a mission to continue to increase the diversity of the plant species on site, particularly the forbes, and thereby also the wildlife that frequents it. Much of the seed to be used will be harvested from the existing bank site, as per reserved right #2 in the Restrictive Covenant of the Mitigation Bank Final Document. Native wetland seed, plants, shrubs and trees that must be purchased will be obtained from one of the local suppliers that the sponsor has used in the past on the adjacent 445 acres of wetland.

The forested areas will be planted with Oregon ash (*Fraxinus latifolia*) at a minimum rate of 150 trees per acre, along with mixture of less aggressive wetland herbaceous species.

The shrub/scrub areas will be planted with either cuttings or plants at 300 to 400 stems per acre, following an initial seeding with a mixture of less aggressive wetland herbaceous species. The shrub areas will be scattered throughout Phase 3 in small plantings, mimicking naturally occurring shrub areas.

**Table 4 - Phase 3 Planting Plan**

<u>Botanical Name</u>	<u>Common Name</u>	<u>Wetland Type</u>	<u>Status</u>
<b>Forest and Shrub Species</b>			
<i>Fraxinus latifolia</i>	Oregon ash	SS/F	FACW
<i>Rosa nutkana</i>	Nootka rose	SS/F	FAC
<i>Salix lasiandra</i>	Pacific willow	SS/F	FACW
<i>Salix sitchensis</i>	Sitka willow	SS/F	FACW
<i>Spiraea douglasii</i>	Douglas' spiraea	SS/F	FACW
<b>Grass Species</b>			
<i>Agrostis exarata</i>	Spike bentgrass	WP	FAC
<i>Beckmania syzigachne</i>	American slough grass	WP/EM	OBL
<i>Deschampsia cespitosa</i>	Tufted hairgrass	WP	FACW
<i>Glyceria occidentalis</i>	Western mannagrass	EM	OBL
<i>Hordeum brachyantherum</i>	Meadow barley	WP	FACW
<i>Danthonia californica</i>	California oatgrass	WP	NL

**Herbaceous Species**

<i>Alisma plantago aquatica</i>	Water plantain	EM	OBL
<i>Bidens cernua</i>	Nodding beggars tick	WP/EM	FACW+
<i>Bidens frondosa</i>	Leafy beggars tick	WP/EM	FACW+
<i>Camassia quamash</i>	Common camas	WP	FACW
<i>Carex densa</i>	Dense sedge	EM	OBL
<i>Carex feta</i>	Green-sheathed sedge	WP	FACW
<i>Carex unilateralis</i>	One-sided sedge	WP	FACW
<i>Downingia elegans</i>	Showy downinga	EM	OBL
<i>Eryngium petiolatum</i>	Rush leaf Coyote thistle	EM	OBL
<i>Grindelia integrifolia</i>	Gumweed	WP	FACW
<i>Juncus ensifolius</i>	Dagger leaf rush	WP	FACW
<i>Juncus nevadensis</i>	Sierra rush	WP	FACW
<i>Juncus oxymetris</i>	Pointed rush	WP/EM	FACW+
<i>Juncus tenuis</i>	Slender rush	WP	FACW-
<i>Lotus purshianus</i>	Spanish-clover	WP	NOL
<i>Plagiobothrys figuratus</i>	Fragrant popcorn flower	WP	FACW
<i>Plagiobothrys scouleri</i>	Scouler's popcorn flower	WP	FACW
<i>Potentilla gracilis</i>	Northwest cirquefoil	WP	FAC
<i>Scirpus tabernaemontani</i>	Softstem bulrush	EM	OBL
<i>Sparganium emersum</i>	Bur-reed	EM	OBL
<i>Veronica scutellata</i>	Marsh speedwell	EM	OBL

WP = wet prairie, EM = emergent, SS/F = shrub/scrub and forest

**D. Proposed Habitat Features**

None are planned.

**E. Planned Buffer**

The current separations between Phase 3 and the surrounding lands were discussed in Section II.K. These separations will all remain in place, no additional buffers will be provided. Phase 3 will become part of an existing and adjacent 445 acre wetland. The sheer size of this wetland provides huge natural buffers. Where the Phase 3 is not bounded by other wetlands it is bounded by agricultural land zoned exclusive farm use. In addition, the site is located over one half mile from any roadway, which additionally takes strain for development off of the adjacent farm land.

A 60' wide railroad right-of-way runs through Phase 3. This right-of-way is not included within the Bank boundaries. The sponsor will however, continue to manage this area as he has for the past 26 years. He plans to plant wetland vegetation within this right-of-way, much as he has farmed it in the past. It will be managed so non-native or invasive species do not become a problem while at the same time restoring additional wetland acres without credits being earned.

The boundaries of the wetland will have physical markers placed at all corners to locate the Bank boundaries.

## F. Reference Site Baseline Information

The reference site is located on an adjacent tax lot also owned by the sponsor. It was restored in 1996 as part of the NRCS Wetland Reserve Program. This area has served as the reference site for both Phases 1 and 2 of the Mud Slough Mitigation Bank and was included in the 2001 Guidebook for Hydrogeomorphic (HGM) – based assessment of Oregon Wetland and Riparian sites, and received extremely high marks, four categories with perfect 1.00 and nothing below 0.50, (scaled to the HFR – highest functioning site of this subclass found by DSL).

The reference site is a slope/flat wetland with a combination of wet prairie, palustrine emergent, scrub/shrub and a small amount of forest. This site includes 78 species, 50 of which are native (64%). This site was planted at a time when there was not as great of an emphasis on native plantings as exists today. Phase 3 will be planted with only native vegetation.

The emergent wetland is dominated by creeping spike rush (*Eleocharis palustris*) and cattail (*Typha latifolia*), the wet prairie is dominated by tufted hairgrass (*Deschampsia cespitosa*) and meadow foxtail (*Alopecurus pratensis*), and the shrub/scrub is dominated by sitka willow (*Salix sitchensis*). The wet prairie areas were burned in September 2006 along with some chemical treatment in an attempt to thin the tufted hairgrass. A mixture of forbes was planted, but it is too early to gauge the long term success. The meadow foxtail was planted on site to provide forage for Canada geese. It has not spread from the areas where it was planted.

The reference site has nearly identical soils to Phase 3. According to the Polk County Soil Survey the reference site's primary soils are the Bashaw silty clay loam (6A), Bashaw clay (7), and Dayton silt loam (25). Phase 3 soils are 92% these same three soils. The soils data for the reference site is included in Section II.E.

## V. PERFORMANCE STANDARDS

### A. Emergent Herbaceous

1. A minimum of 55% of the relative plant cover is comprised of native species. These densities will be a combination of planted individuals and natural recruitment.
2. No more than 15% of the relative plant cover is comprised of non-native invasive species as defined below.
3. The wetland's moisture index is less than 3.0.
4. By year 5, there will be a minimum of 4 obligate species represented in the monitoring plots.

\*Non-native invasive species to be included: reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), Himalayan blackberry (*Rubus discolor*), Japanese knotweed (*Polygonum cuspidatum*), Eurasian water milfoil (*Myriophyllum spicatum*), climbing nightshade (*Solanum dulcamara*) (and yellow-flag iris (*Iris pseudacorus*), Anne's lace (*Daucus carota*), Canadian thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), orchard grass (*Dactylis glomerata*) annual ryegrass (*Lolium multiflorum*), penny royal (*Mentha pelugium*), spatulaleaf loosestrife\* (*Lythrum portula*) and any species listed on the Oregon Department of Agriculture Noxious Weed list that is not already included here. Note: *Lythrum portula* tends to be an early successional species. If the sponsor tries to control it during the first years of the Bank,

other desirable non-targeted species that compete with it may be affected. The sponsor's experience is that in 4 to 5 years, *Lythrum portula* will be out-competed by more desirable species.

**B. Wetgrass Prairie**

1. At least 10 wetgrass prairie species are present
2. Tufted hairgrass (*Deschampsia cespitosa*) is represented by 5% or greater relative plant cover in year 1 and 25% by year 5.
3. At least 50% of the relative plant cover is comprised of native species. These densities will be a combination of planted individuals and natural recruitment.
4. No more than 15% of the relative plant cover is comprised of non-native invasive species as defined above.
5. The prairie's moisture index should be between 2.0 and 3.0.
6. No more than 5% relative plant cover is composed of shrubs or trees.

**C. Overstory and Scrub-Shrub**

1. Relative plant cover, of all layers, is comprised of a minimum of 55% native species.
2. The moisture index is equal or less than 3.0.
3. There will be a minimum of 150 trees per acre and 300-400 shrubs per acre in all years 1-5.
4. No more than 5% of the relative live stem count should be comprised of non-native species.
5. These densities will be a combination of planted individuals and natural recruitment.
6. No more than 15% of the relative plant cover, of all layers, is comprised of non-native invasive species.

**D. Hydrology**

The hydrology objective is to create areas that will hold precipitation to create seasonal saturation and inundation and meet the criteria defined in the 1987 Corps of Engineers Wetlands Delineations Manual (1987 Wetland Delineation Manual).

A one time hydrology delineation designed to meet the requirements of the 1987 Wetland Delineation Manual will be performed. This delineation will include paired plots concentrating along the wetland boundary, any areas dominated by upland vegetation, and any high areas to indicate the exact location of the wetland boundary. The paired plots will be evaluated using soil probes or pits. This will be done to document that wetland hydrology has been achieved throughout the site. In addition to plot data, these areas will be visually documented with photographs to show a dominance of wetland species. The wetland boundary will then be displayed on a site map to confirm acreage achieving the performance measure.

**VI. SITE MAINTENANCE**

The overall goal of the Bank is to provide a contiguous tract of high quality native Willamette Valley wetland habitat which supports a diversity of flora and fauna.

A key component of the site maintenance is systematic weed management. The first step is a two consecutive season herbicide applications, prior to any earthwork being done. This provides as complete elimination of the agricultural crop as possible. After the site is growing,



the herbicide application program continues centering on problematic species. The weed management program then centers on identifying individual species and noting their location over time, so that their removal or spread can be closely monitored. The weeds will be prioritized to assure that highly competitive weeds will be on a closely monitored status while non-competitive weeds will be less of a factor. As species are found that may be new to the sponsor, he can look to local experts to help in the identification and best methods of control. The actual control of the weeds can be done through a combination of species specific spot herbicide application, mowing, and physical removal of individual targeted plant species. Long term monitoring of weedy species will be done through their identification and keeping the records over years to follow patterns and proven methods of abatement (adaptive management). Weed control will be a long term effort by the Bank's sponsor, but will be much less of an effort after the first few years when the desirable wetland species have had a chance to establish themselves in the areas where the weeds have been kept in check.

Other maintenance activities that may occur include berm protection, primary through annual nutria control and the control of excessive overstory encroachment into the prairie and individual species control of more aggressive species that tend to dominate the wetland.

## **VII. MONITORING PLAN**

**Vegetation** - A stratified systematic plot method for sampling points will be used. Transect and sample plot locations will be laid out in a stratified arrangement with equal distance between each transect and sample plot. Forty-one plots in Phase 3 will be assessed according to the performance measures. Transects will be laid out in a stratified arrangement along one baseline with equal distance between each transect (approximately 300'). Transects will run east to west on the west side of the railroad, and north to side on the east side of the railroad. The sampling plots will be predetermined and systematically plotted on transects at equal distance from each other, the location of the first will be randomly chosen. The starting point of the sample plots will be staggered in order to cover a broader area. The sample plots will be permanently identified in the field and will be plotted on a site map. Due to the low percentage of overstory and shrub acres if one or more vegetation types are not adequately covered within the random plots, additional plots will be established to assure sufficient coverage. One additional plot (#41) outside of the mapped transects has been included. This plot has been included to monitor specifically, the small 1.5 acre upland portion of the site, which did not fall within plots transects. See Exhibit B for monitoring point locations.

Each sample point is the center of a circular plot, the diameter of which will be a minimum of ten feet for the herbaceous layer and 30 feet for the scrub/shrub and overstory layers, with center point for the herbaceous, shrub and overstory radius being the same. Each sample plot will be evaluated for species, indicator status, native/non-native and invasive status, the percent cover of each species present. If a plot includes bare soil, the reason for the bare soil will be noted and the percent it covers of each plot included. The number of stems for each shrub and tree species will also be determined.

Prior to concluding monitoring, the number of sample plots within each plant community will be evaluated to determine if this number of plots is sufficient, using a species area curve. The data will be taken and separate species-area curves developed for each of the three habitat types, emergent, wetgrass prairie, and overstory and scrub-shrub. After the curve flattens out it will be

deemed a sufficient number of plots when there are three plots in a row with one or fewer new species. If the species area curve indicates that more sampling plots are needed, they will be added. However, no fewer than 41 sample plots will be examined in Phase 3.

Established site photo stations will be used in each of the monitoring years to provide a visual record of the overall health and diversity of the wetland vegetation. Six photo station locations are included on the Site Plan.

An as-built survey will be submitted to DSL and ACOE after final grading to verify topography and hydrology. The as-built survey will include site topography, wetland boundary, and any other data deemed pertinent.

**Hydrology** - A one time hydrology delineation designed to meet the requirements of the 1987 Wetland Delineation Manual will be performed. This delineation will include paired plots concentrating along the wetland boundary, any areas dominated by upland vegetation, and any high areas to indicate the exact location of the wetland boundary. The paired plots will be evaluated using soil probes or pits. This will be done to document that wetland hydrology has been achieved throughout the site. In addition to plot data, these areas will be visually documented with photographs to show a dominance of wetland species. The wetland boundary will then be displayed on a site map to confirm acreage achieving the performance measure.

**Annual Report** - Detailed annual reports for Phase 3 will be filed with the ACOE and DSL each year for five years after construction and planting are completed. An annual report will consist of site photos (photo points will be set, surveyed, and shown on the as built survey), grading updates (if needed), hydrology monitoring (if needed), vegetation monitoring, progress towards performance standards, remedial actions taken to correct deficiencies that occurred in meeting the standards, and summary of credits sold and available.

A less detailed long term annual report will be submitted until 5 years after the last credit is sold. This less detailed report will be sufficient to demonstrate continuing compliance with performance standards.

## **VIII. ADAPTIVE MANAGEMENT PLAN**

This site is excellent for the restoration of wetlands due to its naturally occurring hydric soils, hydrology, lack of extensive adjacent non-native invasive species, and prior existence as a wetland. These, in combination with a knowledgeable sponsor with years of wetland experience help to assure its success. If however, during monitoring inspections and surveys, a failure to meet one or more performance measures is noted, an analysis will be conducted to determine the cause or causes of the possible failure. Similarly, in the event of damage to the Bank due to vandalism, game damage, drought, flood or other unforeseen complication, an analysis will be conducted to determine if the damage will create a long term negative impact to the Bank. These determinations will be made by the mitigation bank staff which will include a wetland specialist and the owner and any other needed specialist. This team will recommend to the MBRT, an immediate action plan, if warranted, that can be implemented to bring the area back on track to meet the performance measures or mitigate the possible damages. This team will concentrate on using adaptive management practices where possible. An example of adaptive management would be to allow a functioning emergent wetland to exist where prairie was planned or prairie where emergent was planned, rather than trying to alter the hydrology. Another example would

be to allow scrub/shrub area to develop into a forested area should it prove difficult to control the forest species. Other management techniques such as replanting, plant species changes, additional limited excavation or increased game control are also contingency effects that can be used.

## **IX. FINANCIAL ASSURANCES**

The Sponsor will submit a \$51,853 financial assurance for uncertified credit releases per DSL. Uncertified DSL credit release #1 will be up to 15% of the total available credits. Prior to uncertified DSL credit release #1, the following activities will be completed: MBI approval, legally binding permit in place, recorded Restrictive Covenant, grading completed, as-built submitted, and submittal of the financial assurance of \$51,853. If needed, uncertified DSL credit release #2 could occur for up to an additional 15% release (total uncertified DSL release of 30%) of the total available credits. Prior to the uncertified DSL credit release #2, the following activities will be completed: all activities for uncertified DSL credit release #1, plus the initial planting completed (See Credit Release Table in Exhibit D).

If no uncertified credits are needed, the financial assurance to be posted will be determined at the time of credit release. It will be based on the costs yet to be expended per Table 5 - Projected Costs.

### Bond Release Schedule

Release of funds from the financial assurance will be recommended by the MBRT incrementally on the following schedule when, all performance standards, as described in Section V. A-D are being met.

**Table 6 - Bond Release Schedule**

Bond Release Number	Percentage Release	Criteria for Release
1	30	1 year after 1 <sup>st</sup> certified credit release
2	30	2 years after 1 <sup>st</sup> certified credit release
3	30	5 years after 1 <sup>st</sup> credit release
4	10	When the long term endowment and steward are in place (estimated end of year 9)

### X. ENDOWMENT, LONG TERM STEWARD AND MAINTENANCE

Phase 3 will become part of the current endowment system, which includes Phases 1 and 2 of the Bank. The Phase 3 long term plan including the endowment, long term steward and maintenance plan will be finalized prior to the last 30% of the credits being released. The long term steward for the existing phases of the Bank, The Wetland Conservancy (TWC), has agreed to be the long term steward for Phase 3. The endowment for Phase 3, \$40,000; will be placed into an endowment fund, \$1,000 each time a credit is sold from Phase 3. Prior to the sale of the final 30% of the Phase 3 credits, TWC will reevaluate the completed Phase 3, and make a final determination if the Phase 3 endowment is sufficient. This evaluation will be part of the complete long term steward and maintenance package that will be developed for the MBRT at that time.



# Oregon

Theodore R. Kulongoski, Governor

## Department of State Lands

775 Summer Street NE, Suite 100

Salem, OR 97301-1279

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June 9, 2004

State Land Board

Mark and Debbie Knaupp  
1875 Greenwood Road  
Salem, OR 97371

Theodore R. Kulongoski  
Governor

Bill Bradbury  
Secretary of State

Re: Wetland Delineation for Mud Slough Mitigation Bank Expansion,  
Polk County; T7S R4W Sec. 17, TL 400; Sec. 18, TL 100; Sec. 20,  
TL 300; DSL WD #03-0695

Randall Edwards  
State Treasurer

Dear Mr. and Mrs. Knaupp:

This letter is to approve the wetland determinations for the four fields proposed for wetland mitigation bank expansion. All fields have hydric soils and are currently in agricultural use for tall fescue seed production. Based upon field observations and the results of your hydrology monitoring, the determinations and related potential mitigation credit ratios are as follows:

### North Field #1

The field has a subsurface drainage system. Monitoring indicated that it is effectively drained. Therefore, it qualifies for restoration credit (1:1 ratio).

### North Field #2

The field has a subsurface drainage system. Monitoring indicated that most of it is effectively drained, but that the Northeast portion still meets wetland hydrology criteria. Therefore, the effectively drained portion will qualify for restoration ratio credit (1:1) and the wetland portion will qualify for the farmed wetland enhancement ratio credit (2:1).

### Southwest Field

This field has no subsurface drainage system and most of it meets wetland hydrology criteria (ratio 2:1). There is one area near the south edge of the field that is slightly elevated and does not meet hydrology criteria; this area will generate credits at the 1:1 restoration ratio.

Southeast Field

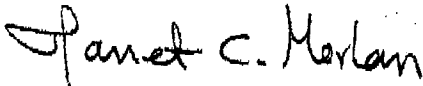
This field has no subsurface drainage system and meets wetland hydrology criteria in its entirety. Credits could be generated at the 2:1 farmed wetland enhancement ratio.

This determination is for purposes of the state Removal-Fill Law only. The Army Corps of Engineers will make a determination for purposes of Section 404 of the Clean Water Act.

This jurisdictional determination is valid for five years from the date of this letter, unless new information necessitates a revision. Circumstances under which the Department may change a determination and procedures for renewal of an expired determination are found in OAR 141-090-0045 (available on our web site or upon request). A request for reconsideration of this determination may be submitted in writing by the applicant, landowner, or agent within 60 calendar days of the date of this letter.

Thank you for conducting the frequent hydrology monitoring, which was key to making the determinations. Please phone me at extension 236 if you have any questions.

Sincerely,



Janet C. Morlan, PWS  
Wetlands Program Manager

Enclosure

cc: Patrick Thompson  
Larry Devroy, DSL  
Judy Linton, Corps of Engineers

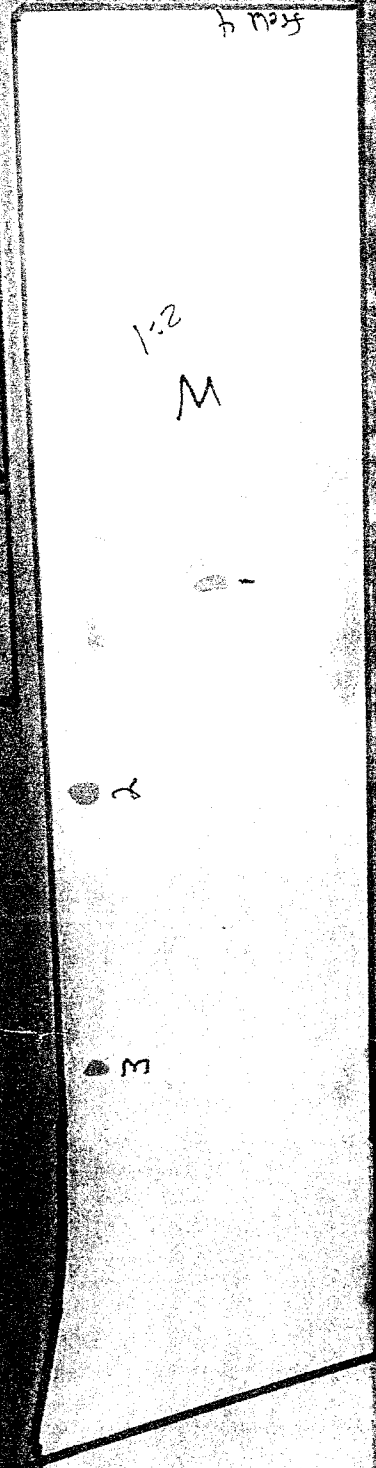
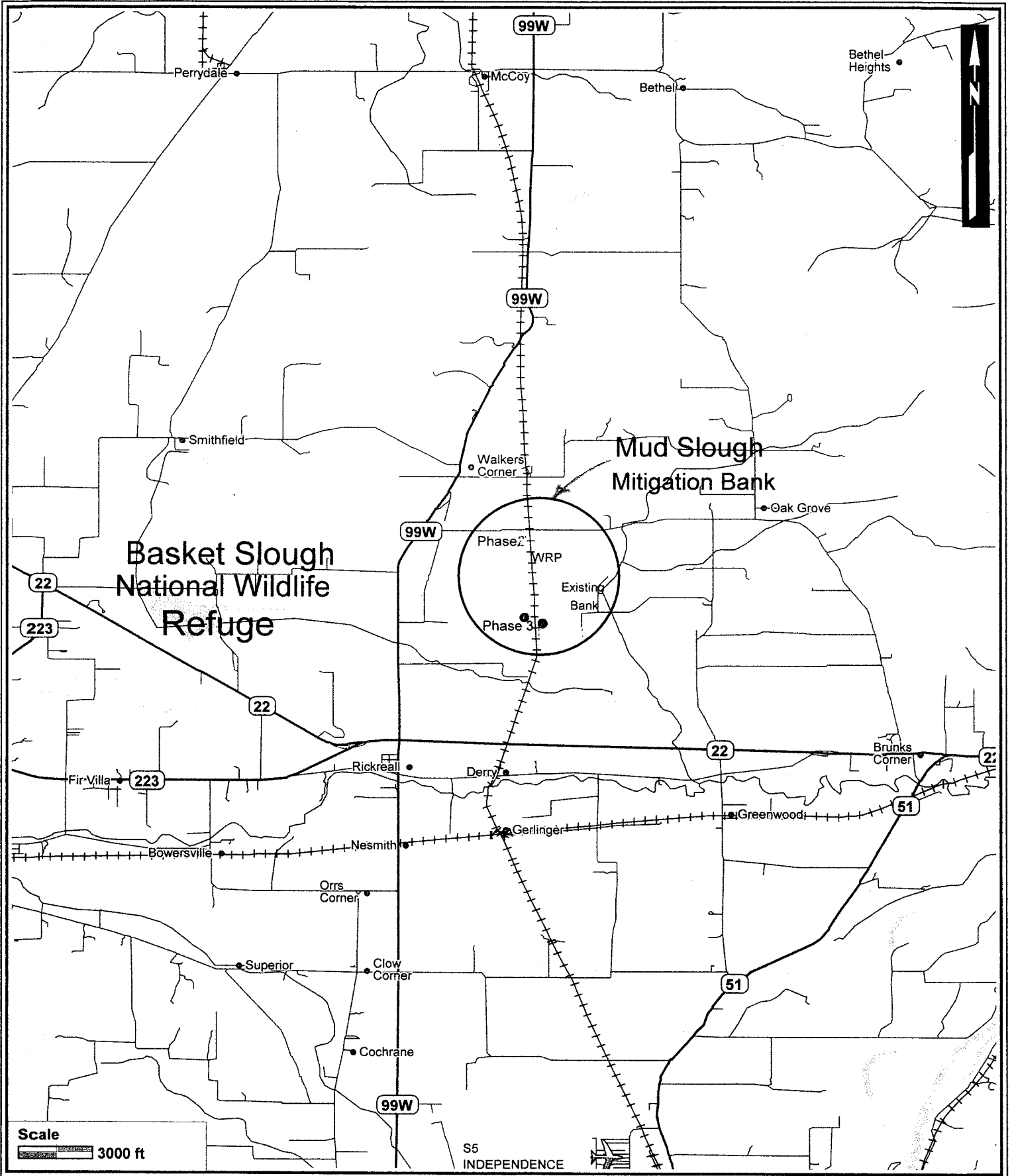


Figure 1

# Mud Slough Wetlands



Map Image Created Using Precision Mapping Streets 4.0

Copyright 1999, Chicago Map Corporation.

## Figure 2





**Mud Sough Mitigation Bank - Phase 3  
Watershed Location Map**

**Figure 3**





Soil Map—Polk County, Oregon  
(Mud Slough Mitigation Bank Phases 3 and 4)

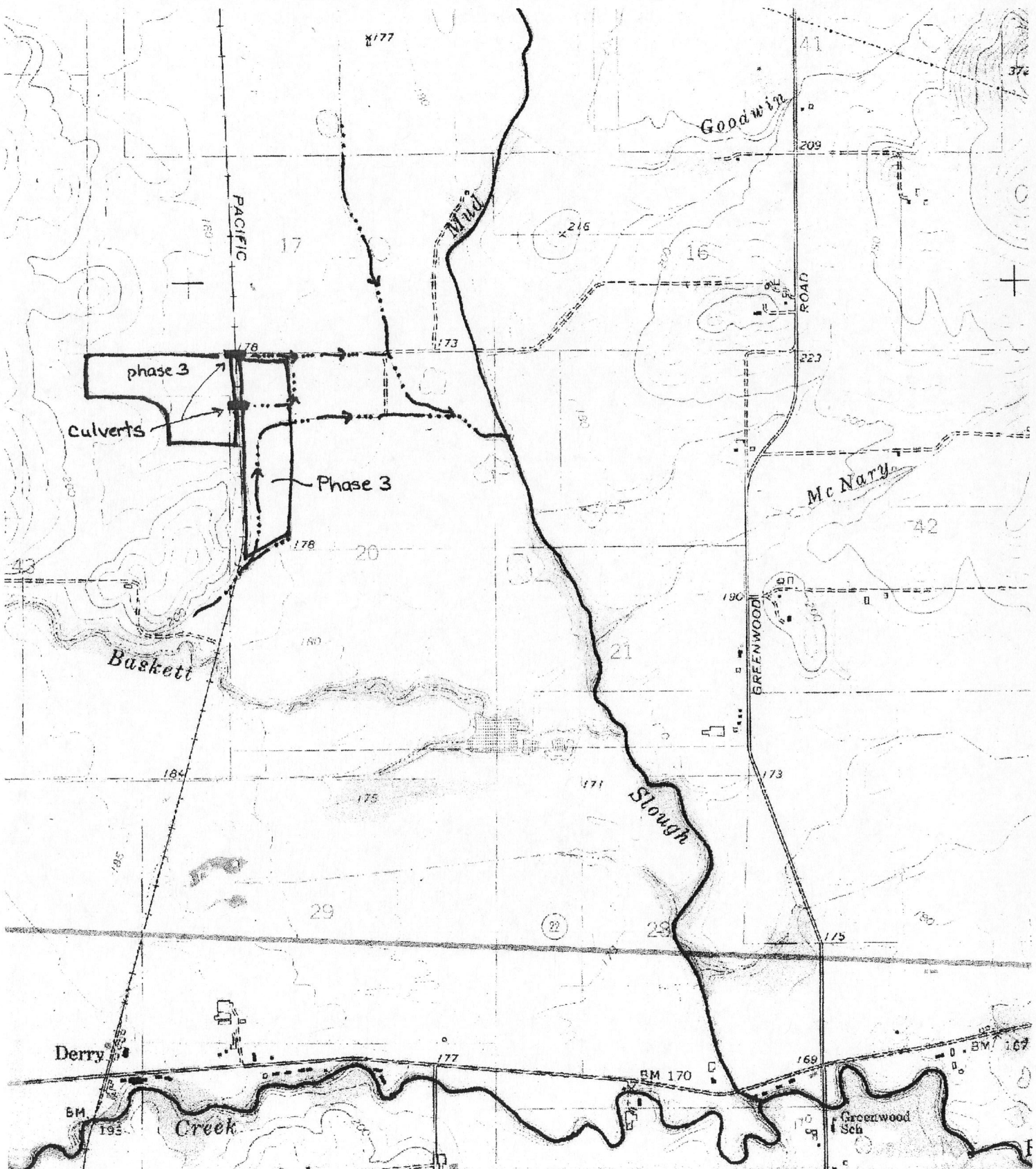


Figure 5



# Mud Slough Mitigation Bank - Phase 3

## Connectivity to Waters of the State Map

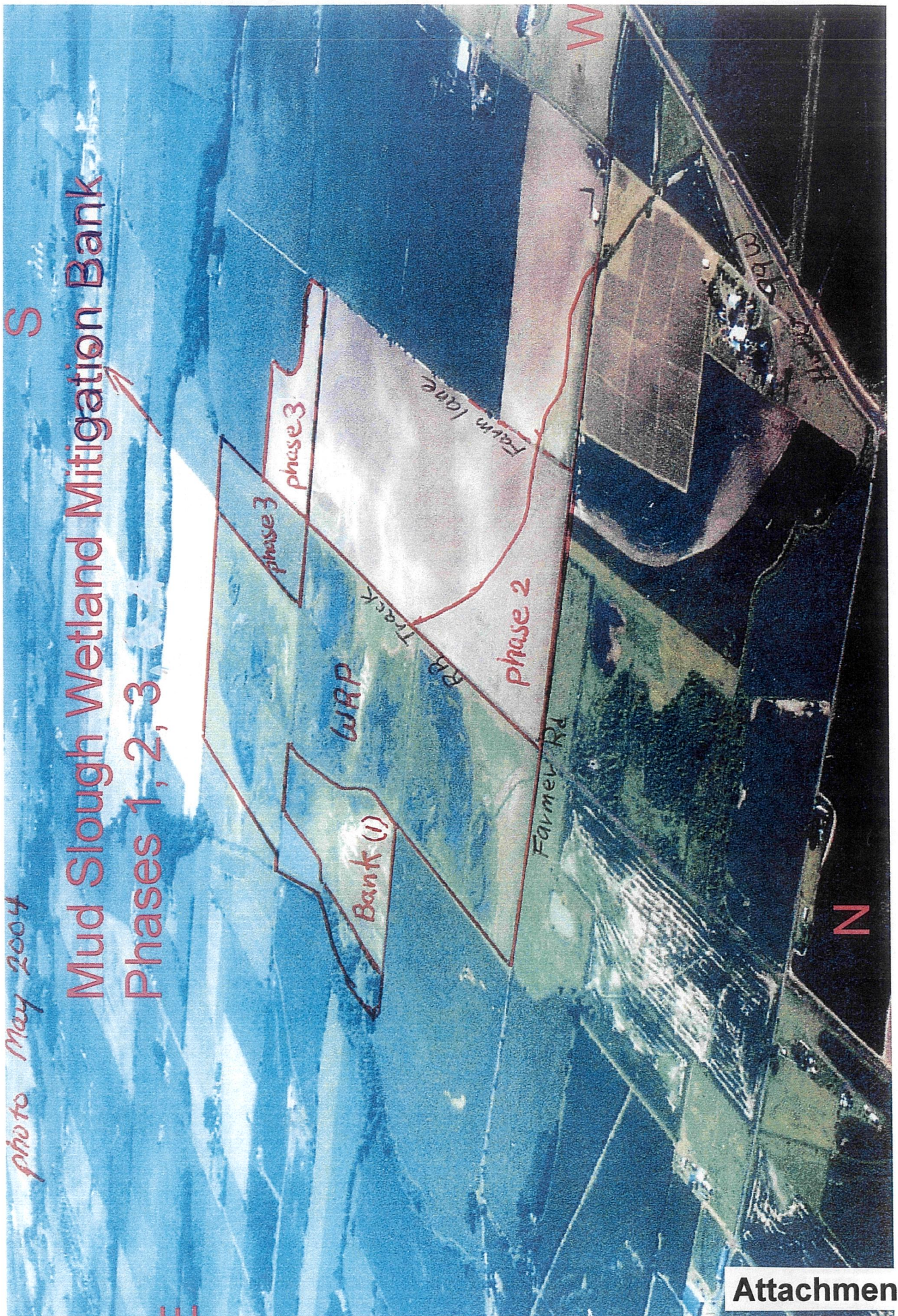


**FIGURE 6**

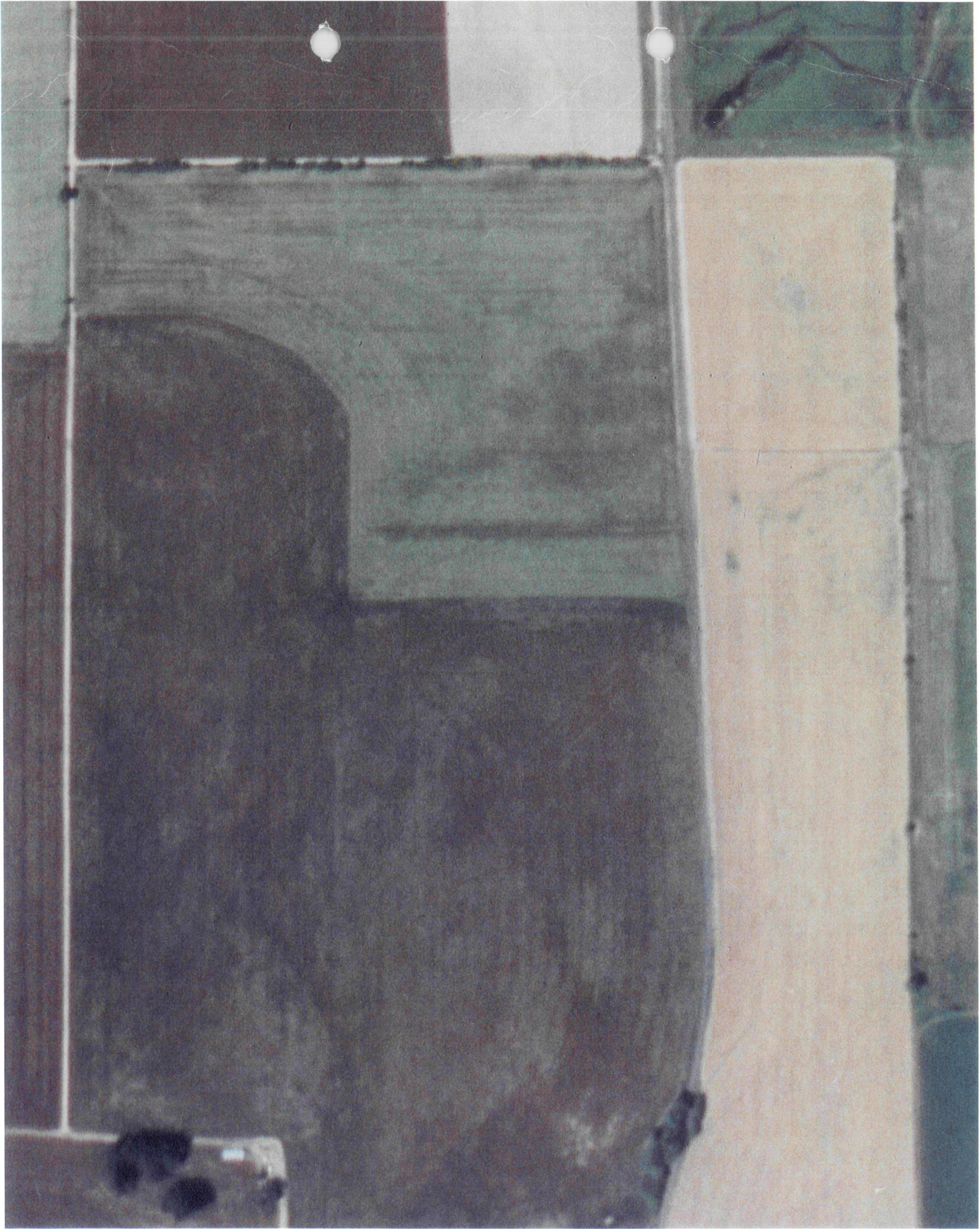


photo May 2004

# Mud Slough Wetland Mitigation Bank Phases 1, 2, 3







**Attachment A**



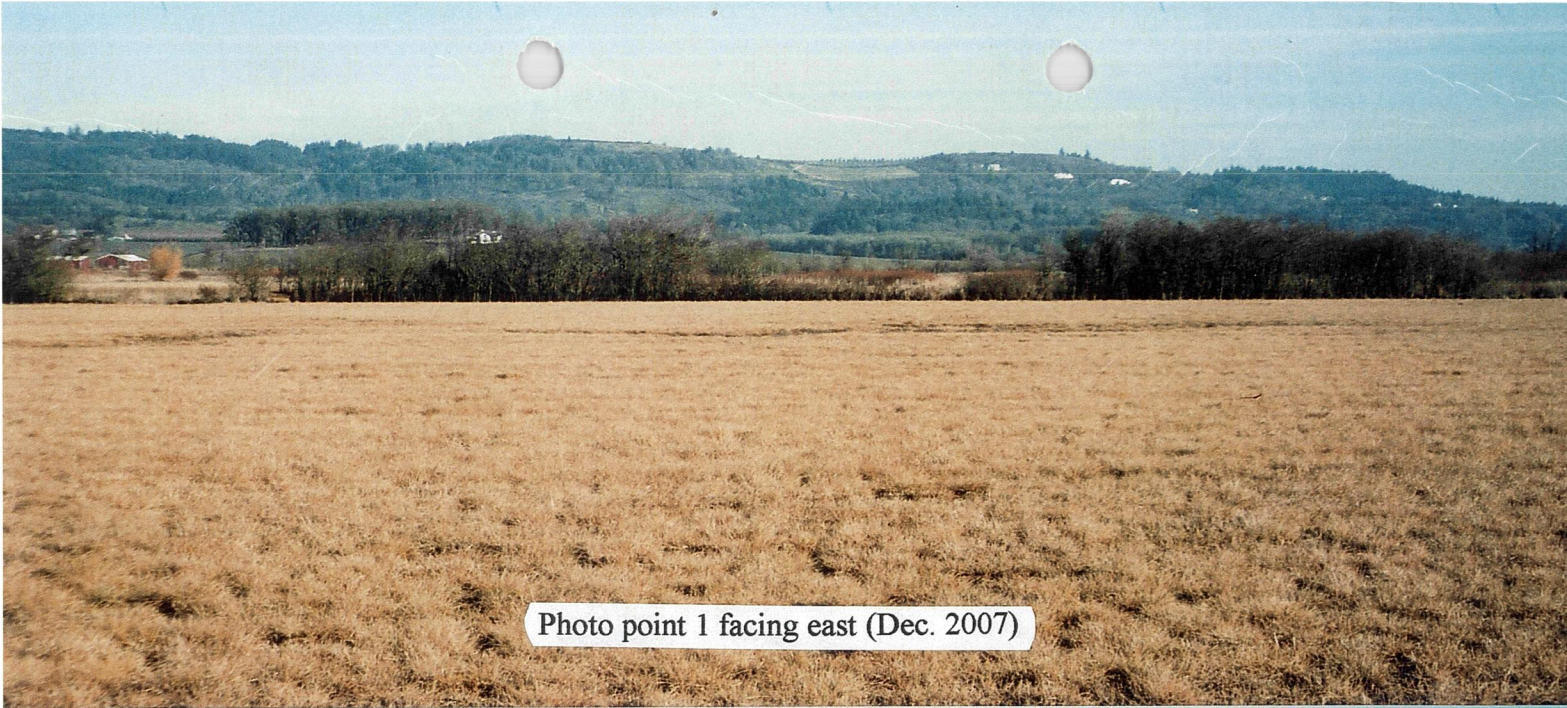


Photo point 1 facing east (Dec. 2007)

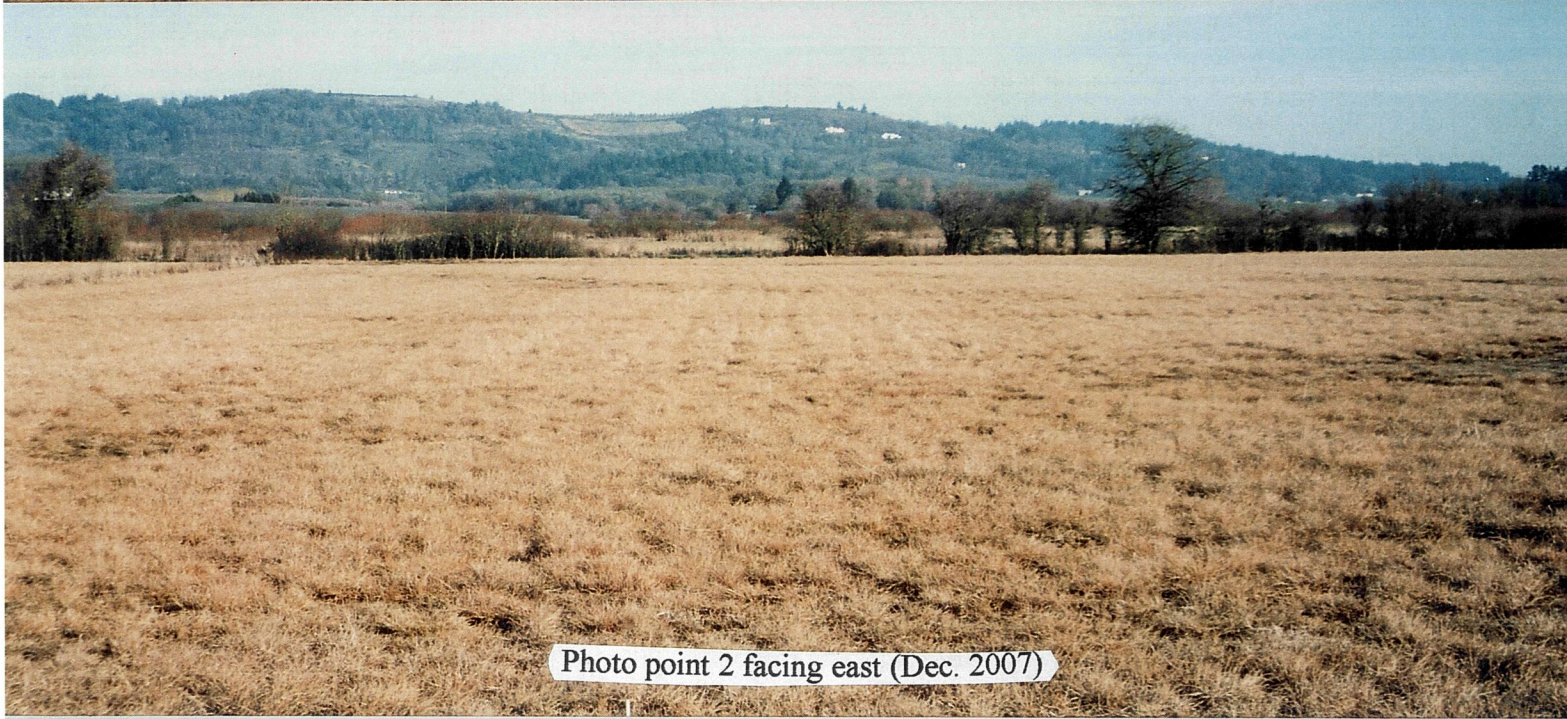


Photo point 2 facing east (Dec. 2007)

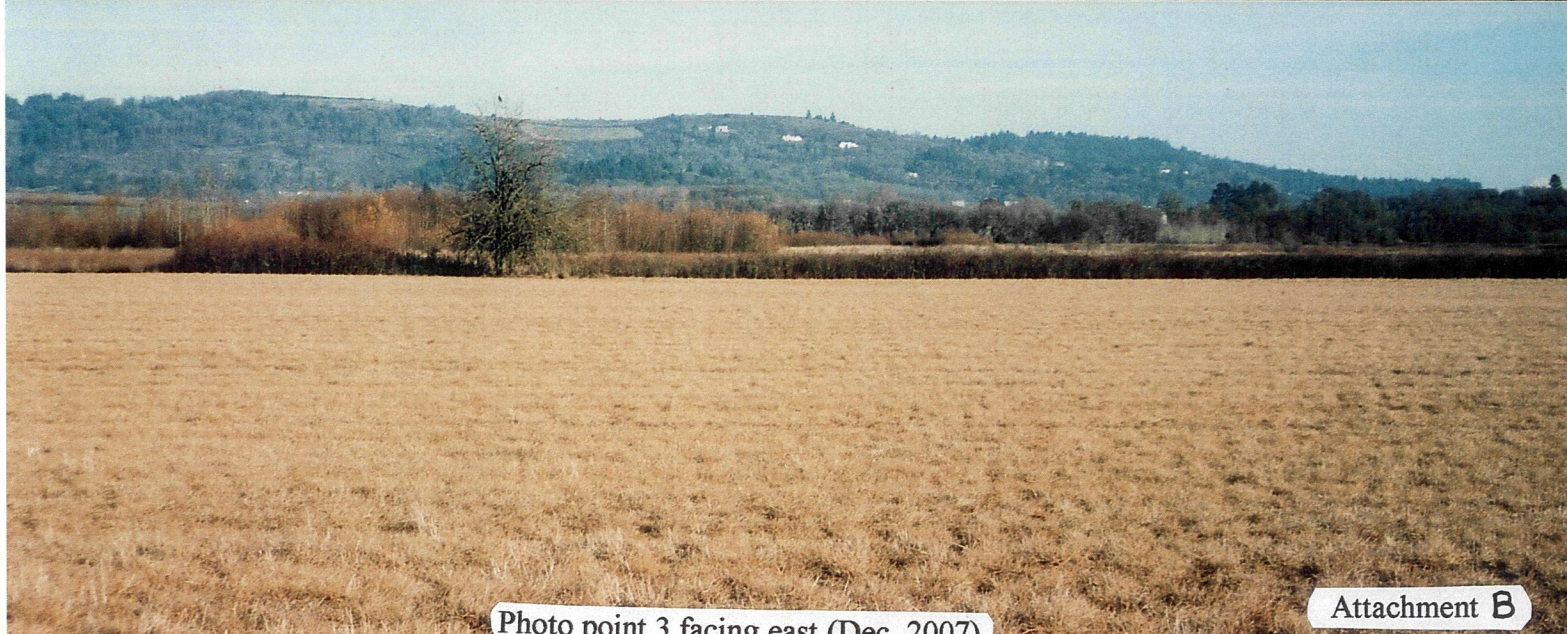


Photo point 3 facing east (Dec. 2007)



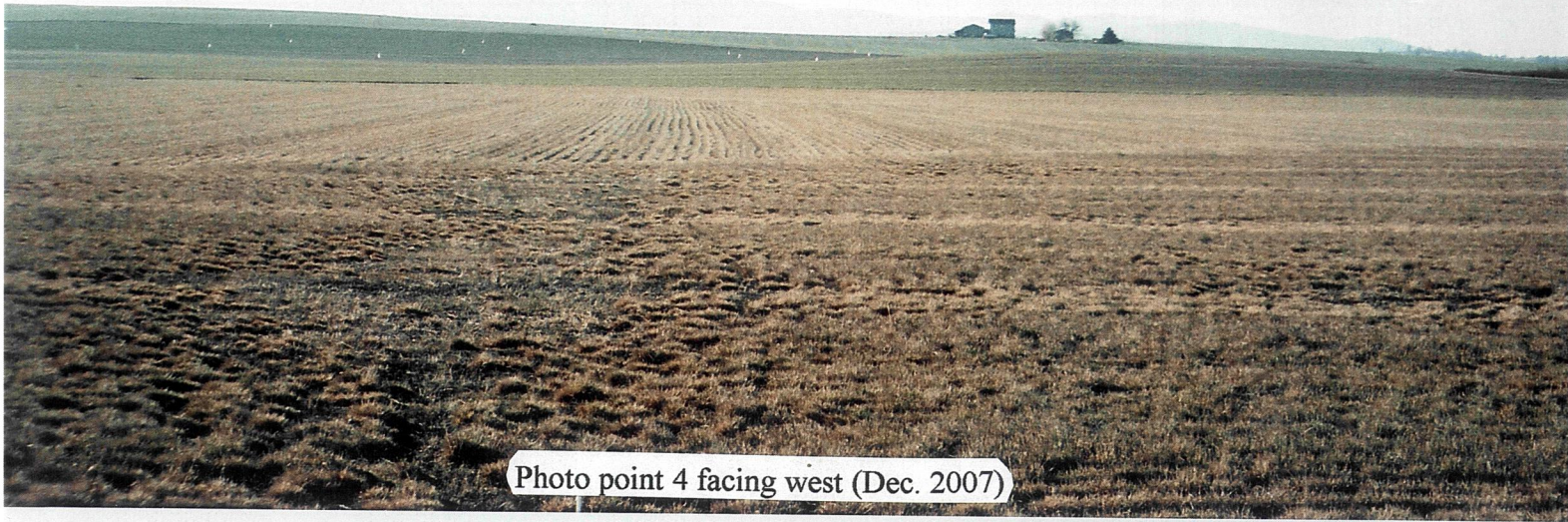


Photo point 4 facing west (Dec. 2007)

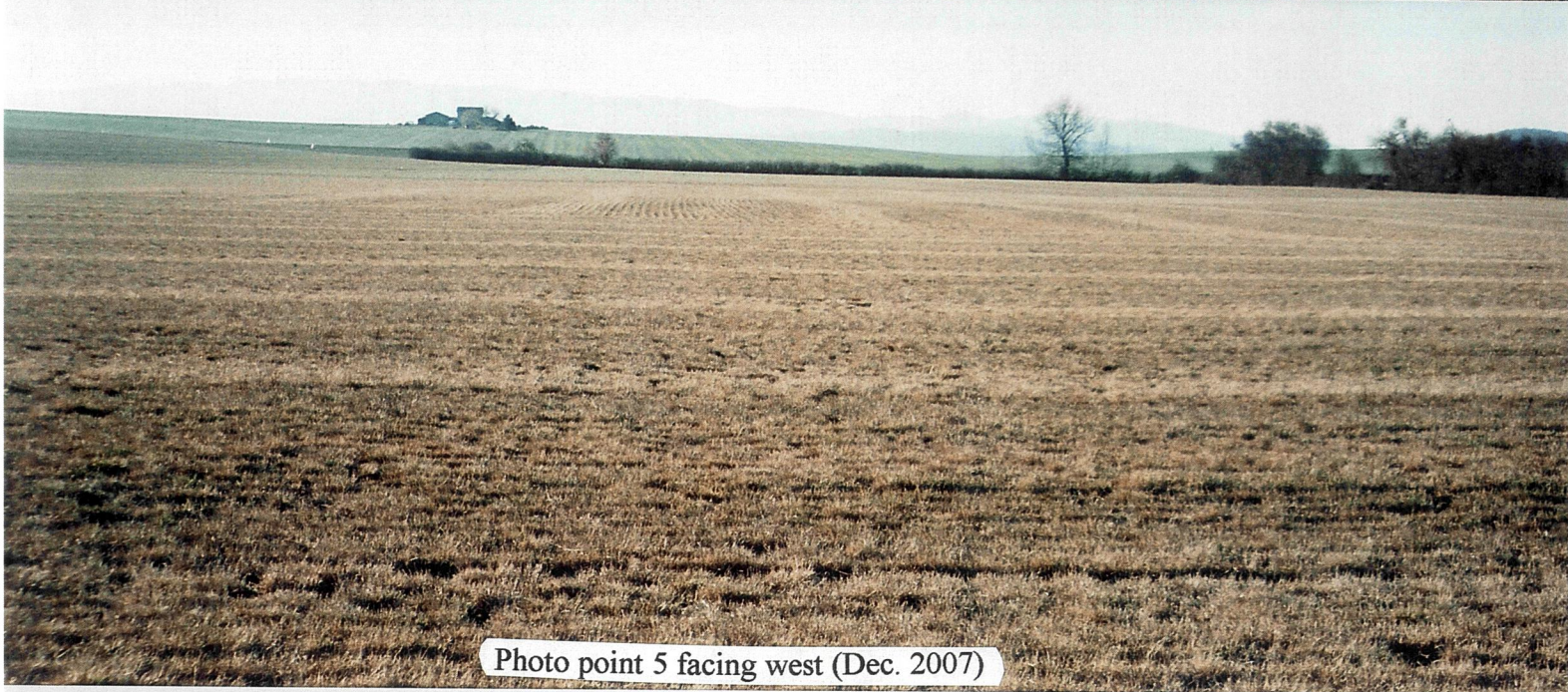


Photo point 5 facing west (Dec. 2007)

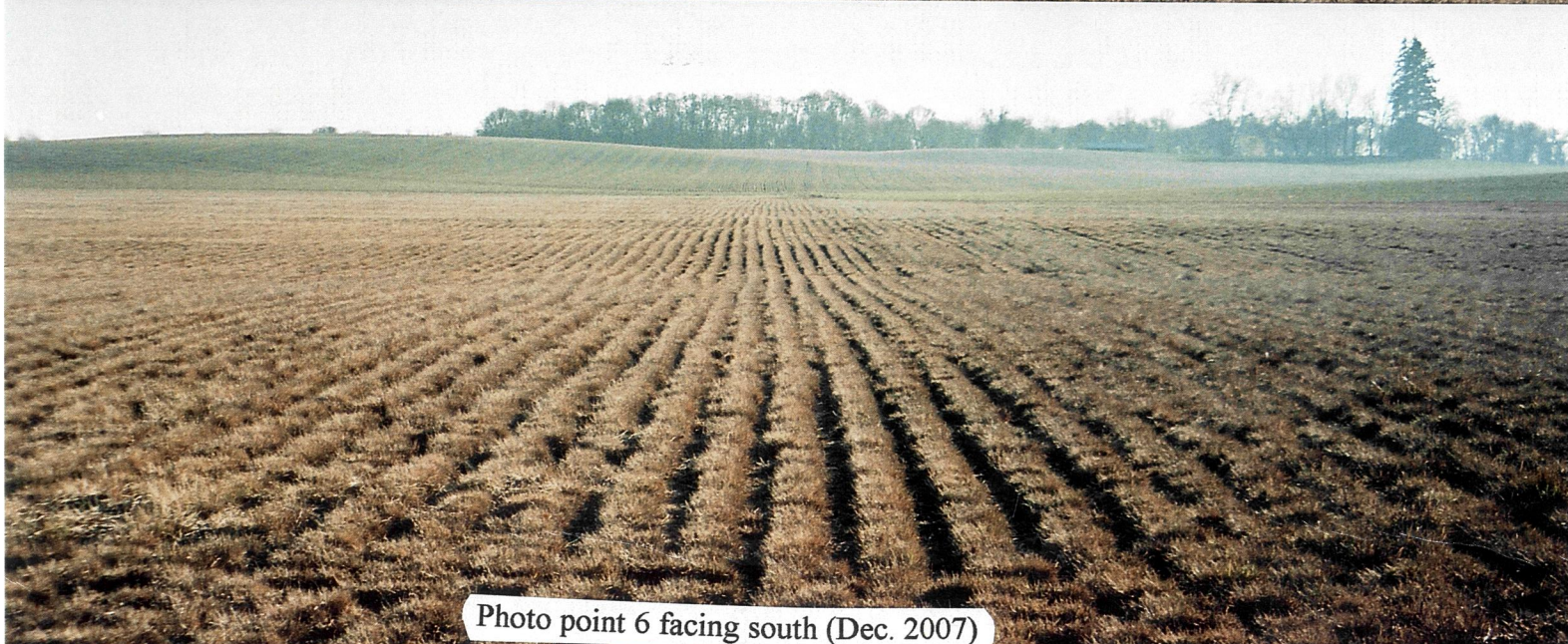


Photo point 6 facing south (Dec. 2007)



**SHEET FOR AUTOMATIC CALCULATION OF FUNCTION SCORES - revised December 2003**

*Slope or Flats subclass*

Site Name: Mud Slough Phase 3 "Pre"

Date:

It is recommended to do a "Save As" from this blank spreadsheet for each use, assigning different file names. This will help reduce the chance of accidentally confusing new data with previously entered data.

For reference, the function(s) addressed by each indicator are noted in column E. Codes are shown below next to the function names. The capital letter in the code (e.g., sp-B) in column E refers to the code for the indicator in the published Volume IA. HFR= scaled to highest functioning site of this subclass found by DSL; LAR= scaled to least-altered site of this subclass found by DSL

Data **must** be entered for every indicator, unless the scale block for this subclass is shaded. Each value in column D must be less than or equal to 1.

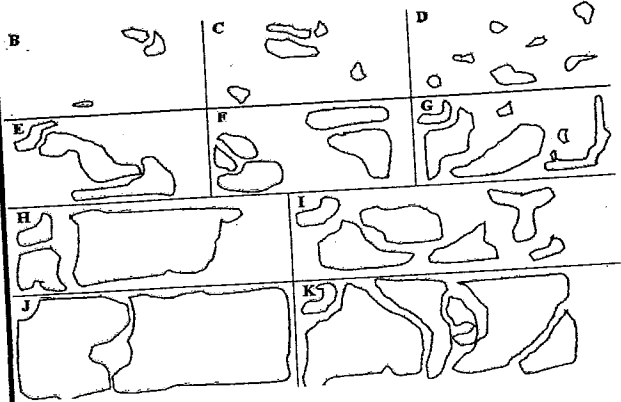
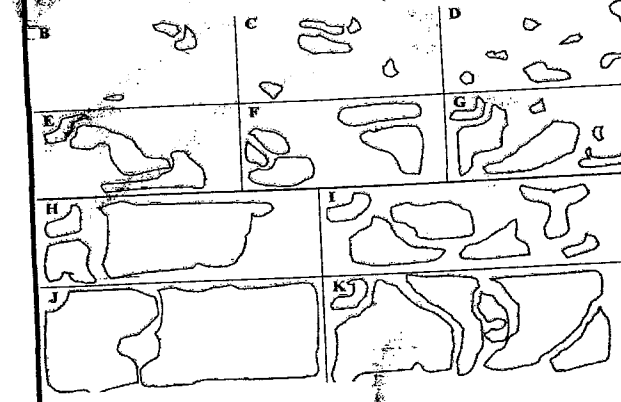
Function:	Calculated Function Capacity for SF sites	
	if HFR:	if LAR:
Water Storage & Delay (ws)	0.05	0.11
Sediment Stabilization & Phosphorus Retention (sp)	0.61	0.65
Nitrogen Removal (n)	0.54	0.72
Primary Production (pp)	0.37	0.53
Invertebrate Habitat Support (i)	0.41	0.41
Amphibian & Turtle Habitat (at)	0.71	0.71
Breeding Waterbird Support (bw)	0.00	0.00
Wintering & Migrating Waterbird Support (ww)	0.67	0.78
Songbird Habitat Support (sb)	0.61	0.68
Support of Characteristic Vegetation (v)	0.43	0.44

Note 1: Models and scores for ws, sp, n, and pp intentionally do not account for the area of the wetland, an especially important factor for these functions.

Note 2: This method should be applied to an entire contiguous wetland, not just to the portion affected directly by a planned alteration or restoration.

Indicator	Raw Datum	Scale for SF sites	Scaled Datum	Function
Presence of permanent surface water (water year-round during most years)? (p. 82)	no	absent = 0 present = 1.0	0	sb-P rf-X
Percent of permanent zone that is open water (i.e., lacking emergent and underwater plants) (p. 79)  (Answer "0" if no permanent zone is present)	0	100 = .1 80-99 = .8 60-80 = 1.0 40-60 = .8 20-40 = .4 0-20 = .2	0	at-M
Percent of site that is inundated only seasonally (i.e., watermarks, moss lines, debris lines, etc.) (p. 81)	5%	none = 0 1-10 = .1 10-25 = .6 25-50 = .8 > 50 = 1.0	0.1	i-B n-A ws-A
		none = 0 1-20 = .5 20-40 = .7 40-60 = .8 60-80 = .9 >80 = 1.0	0.5	ww-A
At least 0.5 acre of surface water persists until at least July 1 and water is mostly wider than 10 ft?	no	Yes = 1 No = 0	0	bw-X

Predominant water depth during biennial low water (p. 82)	0	0" = 0 1-2" = .6 2-24" = 1.0 2-6 ft = .8 >6 ft = .6	0	bw-D
		0 = .1 1-2" = 1.0 2-24" = .8 >24" = .2	0.1	i-D
Percent of site occupied by the most extensive depth category at this site during biennial low water. (p. 81). (Delimit the low water zone first, then break into these depth categories, then identify the category that predominates horizontally).  (Possible categories are: 0 inches; 1-2 inches; 2-24 inches; 2-6 feet; < 6 feet)	100	100 = 0 80-100 = .1 50-80 = .4 30-50 = .8 <30 = 1.0	0	bw-B
Difference between the predominating biennial high and low water levels (p. 71)  0) = No change 1) = Difference of 1 class 2) = Difference of 2 classes 3) = Difference of 3 classes 4) = Difference of 4 classes  Class 1 = 0 inches Class 2 = 1-2 inches Class 3 = 2-24 inches Class 4 = 2-6 feet Class 5 = > 6 feet	2 classes	0) = 0 1) = .3 2) = .5 3) = .8 4) = 1.0	0.5	n-B at-E bw-E
		0) = 0 1) = .25 2) = .5 3) = .75 4) = 1.0	0.5	ww-F
Predominant vertical increase in surface water level (ft) in most of the seasonal zone (i.e., water marks, moss lines, debris lines, etc. Look at the highest point for 2 year flood and measure the difference from biennial low)	6"	0 = 0 .1 - .4 = .25 .5 - 1.0 = .5 1 - 2 = .75 >2 = 1.0	0.5	ws-B
Number of depth categories during biennial high water. (p. 77)  Categories are: ___ 1 - 2 inches ___ 2 - 24 inches ___ 2 - 6 ft ___ > 6 ft	2	1 = 0 2 = .3 3 = .6 4 = 1.0	0.3	bw-C
		1 = .1 2 = .3 3 = .6 4 = 1.0	0.3	ww-E

<p>Percent &amp; distribution of pools during biennial high water. (p. 80)</p> <p>(Note: if site is &gt; 1 acre, select the condition that predominates in 1 acre sub-units of the site.)</p> <p>A = None</p> 	<p>E</p>	<p>A = 0 B = .6 C = .65 D = .7 E, F = .75 K = .8 H = .85 I = .9 J = .95 G = 1.0</p>	<p>0.75</p>	<p>sp-C ww-D i-E, at-A</p>
<p>Percent &amp; distribution of pools during biennial low water. (p. 80)</p> <p>(Note: if site is &gt; 1 acre, select the condition that predominates in 1 acre sub-units of the site.)</p> <p>A = None</p> 	<p>a</p>	<p>A = 0 B = .6 C = .65 D = .7 E, F = .75 J = .8 H = .85 I = .9 K = .95 G = 1.0</p>	<p>0</p>	<p>bw-A, pp-E, n-1</p>
<p>Percent of the site occupied by hummocks (p. 74, 75)</p>	<p>none</p>	<p>none = 0 1-10 = .6 10-90 = .8 &gt;90 = 1.0</p>	<p>0</p>	<p>at-B ww-C sb-M sp-B pp-C n-G i-F</p>

<p>Maximum annual extent of vernal pools/ shorebird scrapes and mudflats: (p. 76)</p> <p>A = none  B = 1 – 100 sq. ft.  C = 100-1000 sq. ft.  D = 1000 – 10,000 sq. ft.  E = &gt;10,000 sq. ft.</p> <p>Must meet ALL of the following:</p> <p>a) herbs are generally &lt; 4" and comprise &lt; 80% ground cover during winter or early spring  b) topography is basically flat  c) inundated to a depth of &lt; 6" for 2 or more continuous weeks  d) never shaded by trees, shrubs, or buildings  e) <u>not entirely a constructed ditch</u></p>	none	A = 0 B = .6 C = .7 D = .8 E = 1.0	0	ww-B
Presence of logs or boulders that extend above the surface of permanent water (p. 84)	none	absent = 0 present = 1.0	0	at-G
Predominant soil texture: (p 83) GC= gravel or cobble SA=sand, sandy loam, or loamy sand L= loam, silty loam, gravelly loam C= clay, sandy clay, silty clay, clay loam, silty clay loam O= organic particles<1mm  <u>Guidance:</u> 1. Soil remains in a ball when squeezed YES...Go to 3; NO ...Go to 2 2. > 50% of the particles (by weight) are > 1 mm YES..."GC"; NO ..."SA" 3. Squeezed soil forms an even ribbon YES... Go to 4; NO ..."SA" 4. Soil ribbon extended > 1" without breaking YES..."C/O"; NO ...Go to 5 5. Soils feels very gritty YES... "SA"; NO..."L"	c	GC =.1 SA =.2 L =.8 C/O = 1.0	1	sp-D
Presence of some mottling and/or other features that indicate oxygen deficits, or, permanent water is present	yes	absent = 0 present = 1.0	1	n-X
Mapped soil series is hydric (not simply a hydric inclusion). See county soil map and p. 75.	yes	1= yes 0= no	1	v-C at-D ww-G i-J
Percent of site that was constructed on former uplands (non-hydric soil) (p. 81): 6) = recent, >90% of site 5) = recent, 10-90% of site 4) = recent, 1-10% of site 3) = >5 years ago, >90% of site 2) = >5 years ago, 10-90% of site 1) = >5 years ago, 1-10% of site 0) = none	0	6) = 0 5) = .1 4) = .2 3) = .3 2) = .4 1) = .5 0) = 1.0	1	i-J at-K v-K n-D

Tally the percent of surrounding land cover (exclude the site itself) as exists during a typical May. Answer each row independently. They do not necessarily sum to 100%.

within 200 ft of the site boundary:

a. % Water, wetland =	50
b. % Grassland, water, wetland =	98
c. % Grassland, row crops =	48
d. % Wooded =	1
e. % Natural (not lawn, crops, paved, building)=	50

within 1000 ft:

f. % Water, wetland =	50
g. % Grassland, water, wetland =	95
h. % Grassland, row crops =	45
i. % Wooded =	3
j. % Natural =	50

within 5,280 ft:

k. % Water, wetland =	40
l. % Grassland, row crops =	90
m. % Wooded =	5

In column D, enter the scaled value for the number in column B. (= a), above)	50	0 = 0 1-10 =.4 10-20 =.8 >20 = 1.0	1	bw-I ww-I
In column D, enter the scaled value for the number in column B. =(b), above)	98	<10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	1	sb-N
In column D, enter the scaled value for the number in column B. =(c), above)	48	<10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0	0.5	ww-K
In column D, enter the scaled value for the number in column B. =(d), above)	1	0 = 0 1-10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	0.1	sb-I
In column D, enter the scaled value for the number in column B. =(e), above)	50	<10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0	0.5	i-L at-O v-R
In column D, enter the scaled value for the number in column B. =(a+f+k)/3, above)	47	none = 0 1 - 10 =.4 10-20 =.8 >20 = 1.0	1	ww-H bw-J

In column D, enter the scaled value for the number in column B. $(=(c+h+1)/3)$ , above)	61	<10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0	0.5	ww-J
In column D, enter the scaled value for the number in column B. $(=(d+i+m)/3)$ , above)	3	<10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	0.1	sb-J
In column D, enter the scaled value for the number in column B. $(=(e+j)/2)$ , above)	50	<10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0	0.5	bw-K
In column D, enter the scaled value for the number in column B. $(=(b+g)/2)$ , above)	96.5	<10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	1	sb-O
Percent of land cover within 200 ft (but only in the contributing watershed) that is "natural" – that is, NOT cropland, lawns, pavement, or buildings (p. 79)	50	<10 = 0 10-20 =.1 20-40 =.3 40-90 =.5 90-100 = 1.0	0.5	pp-F
		<10 = 0 10-20 =.1 20-40 =.3 40-90 =.5 90-99 =.9 100 = 1.0	0.5	i-M v-Q
Percent woodland divided by percent grassland-crops within 200 ft of the site (p. 71)	0.1	<.1 =.1 0.1-0.8 =.6 0.8-1.2 = 1.0 1.2 -2.0 =.6 >2.0 =.1	0.1	at-P
Distance (ft) to nearest busy road (p. 71)  This includes a) any road or parking lot in a develop area that contains >4 buildings per acre, b) any road with a maximum traffic rate of > 6 vehicles per minute, during an average day during the summer	5000'	<100 = 0 100-300 =.3 300-600 =.5 600-1200 =.7 1200-2400 =.8 2400-4800 =.9 >4800 = 1.0	1	bw-G at-N v-P sb-R

**Note: The following 5 rows must sum to 100%. The number of visitors is immaterial.**

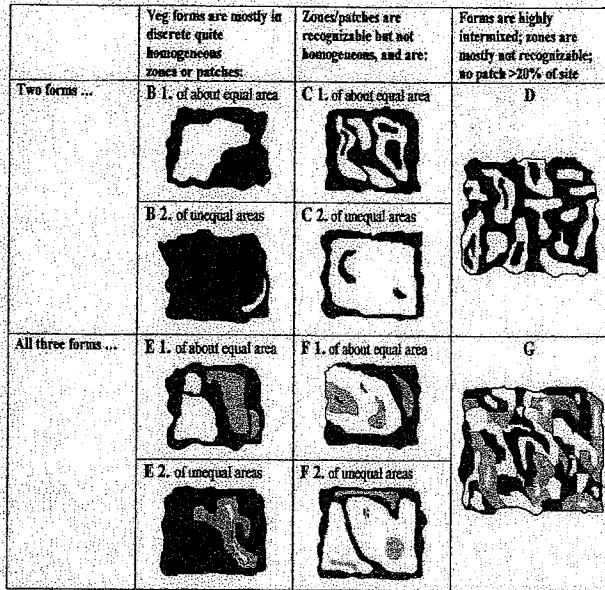
Percent of site including 100-ft buffer that is visited 365 days a year or almost so =	5
Percent of site including 100-ft buffer that is visited more than 80 days a year (>20% of year), but less than daily =	
Percent of site including 100-ft buffer that is visited 20-80 days a year (e.g., about once a week) =	45
Percent of site including 100-ft buffer that is visited just a few days a year =	50
Percent of site including 100-ft buffer that is almost never visited =	0

Scale the calculated value in the box on the right (sum of the above 5 rows) and enter the scaled value in column D (p. 72)	340	100-200 = 0 200-300 =.3 300-400 =.7 400-500 =1.0	0.7	bw-H v-O sb-Q
Percent of site affected by soil leveling  (i.e., portion previously leveled by equipment for farming)	100	100 =.1 10-99 =.3 1-10 =.6 0 = 1.0	0.1	at-C i-G pp-D sp-F n-H
Percent of site currently affected by soil compaction: (i.e., by equipment, vehicles, livestock, humans, fill) 6 = recent, at >90% of site 5 = recent, at 10-90% of site 4 = recent, at 1-10% of site 3 = >5 years ago, >90% of site 2 = >5 years ago, 10-90% of site 1 = >5 years ago, 1-10% of site 0 = none	6	5/6) =.1 4) =.2 3) =.4 2) =.6 1) =.8 0) = 1.0	0.1	sp-G v-M sb-K
Percent of site's vegetation that is mowed or subject to extreme grazing at least annually (p. 81)	100	>90 = 0 10-90 =.2 1-10 =.4 none = 1.0	0	sb-L v-N
Most of site is burned, or harvested for hay or timber, at least biennially? (p. 72)	yes	no = 0 yes = 1.0	1	n-J
Percent of site currently affected by soil mixing (plowing, excavation, bulldozing, etc.): (p. 81) 6 = recent, at >90% of site 5 = recent, at 10-90% of site 4 = recent, at 1-10% of site 3 = >5 years ago, >90% of site 2 = >5 years ago, 10-90% of site 1 = >5 years ago, 1-10% of site 0 = none	6	5 or 6 =.1 4 =.2 3 =.4 2 =.6 1 =.8 0 = 1.0	0.1	at-f i-H v-L pp-A n-C sp-E
Percent of the site that is vegetated (including submersed aquatics) (p. 82)	100	<10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	1	sb-A v-A

Percent of site with woody vegetation (p. 62)	0	<10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	0.1	sb-b
Percent of seasonal zone that is bare during most of the dry season. (i.e., devoid of vegetation, except trees)  (Answer "0" if no seasonal zone)	0	>80 = 0 60-80 =.2 40-60 =.4 20-40 =.6 1-20 =.8 0 = 1.0	1	pp-G sp-H
Percent of site that is inundated permanently and contains emergent, floating, or submersed plants (p. 72)	0	0 = 0 1-10 =.9 >10 = 1.0	0	i-A
		0 = 0 1-10 =.4 10-30 =.8 30-60 = 1.0 60-90 =.9 >90 =.6	0	bw-F
Percent cover of herbs within the seasonal zone (p. 72)	100	0 = 0 1-30 =.1 30-50 =.6 50-70 =.75 70-100 = 1.0	1	at-L
Percent of whole site that has closed canopy (p. 80)	0	<10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	0.1	sb-C
Percent understory shrub & vine cover beneath the drip line of trees (p. 82)  (Answer "0" if no wooded areas)	0	<10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	0	sb-D



Number & distribution of vegetation forms -- herbs, shrubs, trees. If only one form, answer "A". To count, the patch must comprise >0.5 acre or >5% of vegetated area. See p. 77 for enlargement of diagram.



A

- A = 0
- B2 = .60
- C2 = .65
- B1 = .70
- C1, D = .75
- E2 = .80
- F2 = .85
- E1 = .90
- F1 = .95
- G = 1.0

0

- pp-B
- v-B
- at-J
- i-K
- sb-H

Number of woody species (p. 82)

0

- unwooded = 0
- 1-2 = .1
- 3-4 = .25
- 5-6 = .5
- 7-9 = .75
- 10-18 = .9
- >18 = 1.0

0

sb-E

Number of native woody species (p. 78)

0

- 0 = 0
- 1 = .1
- 2-3 = .25
- 4-5 = .5
- 6-9 = .75
- 10-13 = .9
- >14 = 1.0

0

v-F

Percent of woody species list consisting of species that are native (p. 78)

0

- 0 = 0
- 1-57 = .1
- 58-66 = .25
- 67-74 = .5
- 75-79 = .75
- 80-99 = .9
- 100 = 1.0

0

v-g

Percent of woody cover within stratum that is comprised of non-native species (p. 82)

no woody

- 100 = 0
- 80-99 = .1
- 30-79 = .25
- 10-29 = .5
- 5-9 = .75
- 1-4 = .9
- 0 = 1.0

v-H

(Use the greater of the tree, understory shrub, or open shrub stratum's percent)

Spatial predominance of non-native herbs (p. 84)

A

- A = 0
- B = .5
- C = 1.0

0

v-D

- A = Non-natives predominate
- B = Cannot determine (about equal)
- C = Natives predominate



**SHEET FOR AUTOMATIC CALCULATION OF FUNCTION SCORES - revised December 2003**

***Slope or Flats subclass***

Site Name: *Mud Slough Phase 3 "Post"* Date:

It is recommended to do a "Save As" from this blank spreadsheet for each use, assigning different file names. This will help reduce the chance of accidentally confusing new data with previously entered data.

For reference, the function(s) addressed by each indicator are noted in column E. Codes are shown below next to the function names. The capital letter in the code (e.g., sp-B) in column E refers to the code for the indicator in the published Volume IA.

**HFR**= scaled to highest functioning site of this subclass found by DSL; **LAR**= scaled to least-altered site of this subclass found by DSL

Data **must** be entered for every indicator, unless the scale block for this subclass is shaded. Each value in column D must be less than or equal to 1.

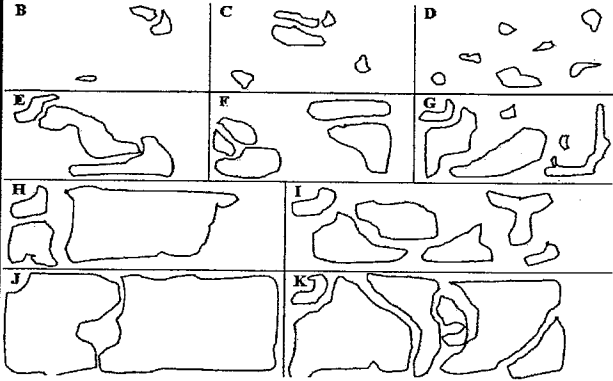
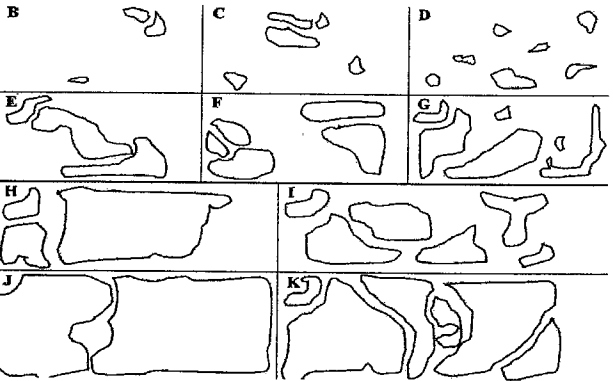
Function:	Calculated Function Capacity for SF sites	
	if HFR:	if LAR:
Water Storage & Delay (ws)	0.40	0.89
Sediment Stabilization & Phosphorus Retention (sp)	0.75	0.80
Nitrogen Removal (n)	0.56	0.74
Primary Production (pp)	0.53	0.70
Invertebrate Habitat Support (i)	0.52	0.52
Amphibian & Turtle Habitat (at)	0.75	0.75
Breeding Waterbird Support (bw)	0.00	0.00
Wintering & Migrating Waterbird Support (ww)	0.73	0.84
Songbird Habitat Support (sb)	0.67	0.74
Support of Characteristic Vegetation (v)	0.94	0.97

**Note 1:** Models and scores for ws, sp, n, and pp intentionally do not account for the **area** of the wetland, an especially important factor for these functions.

**Note 2:** This method should be applied to an entire contiguous wetland, not just to the portion affected directly by a planned alteration or restoration.

Indicator	Raw Datum	Scale for SF sites	Scaled Datum	Function
Presence of permanent surface water (water year-round during most years)? (p. 82)	no	absent = 0 present = 1.0	0	sb-P rf-X
Percent of permanent zone that is open water (i.e., lacking emergent and underwater plants) (p. 79)  (Answer "0" if no permanent zone is present)	0	100 = .1 80-99 = .8 60-80 = 1.0 40-60 = .8 20-40 = .4 0-20 = .2	0.2	at-M
Percent of site that is inundated only seasonally (i.e., watermarks, moss lines, debris lines, etc.) (p. 81)	30%	none = 0 1-10 = .1 10-25 = .6 25-50 = .8 > 50 = 1.0	0.8	i-B n-A ws-A
		none = 0 1-20 = .5 20-40 = .7 40-60 = .8 60-80 = .9 >80 = 1.0	0.7	ww-A
At least 0.5 acre of surface water persists until at least July 1 and water is mostly wider than 10 ft?	no	Yes = 1 No = 0	0	bw-X

Predominant water depth during biennial low water (p. 82)	0	0" = 0 1-2" = .6 2-24" = 1.0 2-6 ft = .8 >6 ft = 6	0	bw-D
		0 = .1 1-2" = 1.0 2-24" = .8 >24" = .2	0.1	i-D
Percent of site occupied by the most extensive depth category at this site during biennial low water. (p. 81). (Delimit the low water zone first, then break into these depth categories, then identify the category that predominates horizontally).  (Possible categories are: 0 inches; 1-2 inches; 2-24 inches; 2-6 feet; < 6 feet)	100	100 = 0 80-100 = .1 50-80 = .4 30-50 = .8 <30 = 1.0	0	bw-B
Difference between the predominating biennial high and low water levels (p. 71)  0) = No change 1) = Difference of 1 class 2) = Difference of 2 classes 3) = Difference of 3 classes 4) = Difference of 4 classes  Class 1 = 0 inches Class 2 = 1-2 inches Class 3 = 2-24 inches Class 4 = 2-6 feet Class 5 = > 6 feet	2 classes	0) = 0 1) = .3 2) = .5 3) = .8 4) = 1.0	0.5	n-B at-E bw-E
		0) = 0 1) = .25 2) = .5 3) = .75 4) = 1.0	0.5	ww-F
Predominant vertical increase in surface water level (ft) in most of the seasonal zone (i.e., water marks, moss lines, debris lines, etc. Look at the highest point for 2 year flood and measure the difference from biennial low)	6"	0 = 0 .1 - .4 = .25 .5 - 1.0 = .5 1 - 2 = .75 >2 = 1.0	0.5	ws-B
Number of depth categories during biennial high water. (p. 77)  Categories are: ___ 1 - 2 inches ___ 2 - 24 inches ___ 2 - 6 ft ___ > 6 ft	2	1 = 0 2 = .3 3 = .6 4 = 1.0	0.3	bw-C
		1 = .1 2 = .3 3 = .6 4 = 1.0	0.3	ww-E

<p>Percent &amp; distribution of pools during biennial high water. (p. 80)</p> <p>(Note: if site is &gt; 1 acre, select the condition that predominates in 1 acre sub-units of the site.)</p> <p>A = None</p> 	<p>E</p>	<p>A = 0 B = .6 C = .65 D = .7 E, F = .75 K = .8 H = .85 I = .9 J = .95 G = 1.0</p>	<p>0.75</p>	<p>sp-C ww-D i-E, at-A</p>
<p>Percent &amp; distribution of pools during biennial low water. (p. 80)</p> <p>(Note: if site is &gt; 1 acre, select the condition that predominates in 1 acre sub-units of the site.)</p> <p>A = None</p> 	<p>a</p>	<p>A = 0 B = .6 C = .65 D = .7 E, F = .75 J = .8 H = .85 I = .9 K = .95 G = 1.0</p>	<p>0</p>	<p>bw-A, pp-E, n-1</p>
<p>Percent of the site occupied by hummocks (p. 74, 75)</p>	<p>none</p>	<p>none = 0 1-10 = .6 10-90 = .8 &gt;90 = 1.0</p>	<p>0</p>	<p>at-B ww-C sb-M sp-B pp-C n-G i-F</p>

<p>Maximum annual extent of vernal pools/ shorebird scrapes and mudflats: (p. 76)</p> <p>A = none  B = 1 – 100 sq. ft.  C = 100-1000 sq. ft.  D = 1000 – 10,000 sq. ft.  E = &gt;10,000 sq. ft.</p> <p>Must meet ALL of the following:</p> <p>a) herbs are generally &lt; 4” and comprise &lt; 80% ground cover during winter or early spring  b) topography is basically flat  c) inundated to a depth of &lt; 6” for 2 or more continuous weeks  d) never shaded by trees, shrubs, or buildings  e) not entirely a constructed ditch</p>	none	A = 0 B = .6 C = .7 D = .8 E = 1.0	0	ww-B
Presence of logs or boulders that extend above the surface of permanent water (p. 84)	none	absent = 0 present = 1.0	0	at-G
Predominant soil texture: (p 83) GC= gravel or cobble SA=sand, sandy loam, or loamy sand L= loam, silty loam, gravelly loam C= clay, sandy clay, silty clay, clay loam, silty clay loam O= organic particles<1mm  <u>Guidance:</u> 1. Soil remains in a ball when squeezed YES...Go to 3; NO ...Go to 2 2. > 50% of the particles (by weight) are > 1 mm YES...”GC”; NO ...”SA” 3. Squeezed soil forms an even ribbon YES...Go to 4; NO ...”SA” 4. Soil ribbon extended > 1" without breaking YES...”C/O”; NO ...Go to 5 5. Soils feels very gritty YES... ”SA”; NO...”L”	c	GC =.1 SA =.2 L =.8 C/O = 1.0	1	sp-D
Presence of some mottling and/or other features that indicate oxygen deficits, or, permanent water is present	yes	absent = 0 present = 1.0	1	n-X
Mapped soil series is hydric (not simply a hydric inclusion). See county soil map and p. 75.	yes	1= yes 0= no	1	v-C at-D ww-G i-I
Percent of site that was constructed on former uplands (non-hydric soil) (p. 81): 6) = recent, >90% of site 5) = recent, 10-90% of site 4) = recent, 1-10% of site 3) = >5 years ago, >90% of site 2) = >5 years ago, 10-90% of site 1) = >5 years ago, 1-10% of site 0) = none	0	6) = 0 5) = .1 4) = .2 3) = .3 2) = .4 1) = .5 0) = 1.0	1	i-J at-K v-K n-D

Tally the percent of surrounding land cover (exclude the site itself) as exists during a typical May. Answer each row independently. They do not necessarily sum to 100%.

within 200 ft of the site boundary:

a. % Water, wetland =	50
b. % Grassland, water, wetland =	98
c. % Grassland, row crops =	48
d. % Wooded =	1
e. % Natural (not lawn, crops, paved, building)=	50

within 1000 ft:

f. % Water, wetland =	50
g. % Grassland, water, wetland =	95
h. % Grassland, row crops =	45
i. % Wooded =	3
j. % Natural =	50

within 5,280 ft:

k. % Water, wetland =	40
l. % Grassland, row crops =	90
m. % Wooded =	5

In column D, enter the scaled value for the number in column B. (= a), above)	50	0 = 0 1-10 =.4 10-20 =.8 >20 = 1.0	1	bw-I ww-I
In column D, enter the scaled value for the number in column B. (=b), above)	98	<10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	1	sb-N
In column D, enter the scaled value for the number in column B. (=c), above)	48	<10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0	0.5	ww-K
In column D, enter the scaled value for the number in column B. (=d), above)	1	0 = 0 1-10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	0.1	sb-I
In column D, enter the scaled value for the number in column B. (=e), above)	50	<10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0	0.5	i-L at-O v-R
In column D, enter the scaled value for the number in column B. (= (a+f+k)/3), above)	47	none = 0 1 - 10 =.4 10-20 =.8 >20 = 1.0	1	ww-H bw-J

In column D, enter the scaled value for the number in column B. (= (c+h+1)/3), above)	61	<10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0	0.5	ww-J
In column D, enter the scaled value for the number in column B. (= (d+i+m)/3), above)	3	<10 = .1 10-20 = .2 20-40 = .4 40-60 = .6 60-80 = .8 >80 = 1.0	0.1	sb-J
In column D, enter the scaled value for the number in column B. (= (e+j)/2), above)	50	<10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0	0.5	bw-K
In column D, enter the scaled value for the number in column B. (= (b+g)/2), above)	96.5	<10 = .1 10-20 = .2 20-40 = .4 40-60 = .6 60-80 = .8 >80 = 1.0	1	sb-O
Percent of land cover within 200 ft (but only in the contributing watershed) that is "natural" – that is, NOT cropland, lawns, pavement, or buildings (p. 79)	50	<10 = 0 10-20 = .1 20-40 = .3 40-90 = .5 90-100 = 1.0	0.5	pp-F
		<10 = 0 10-20 = .1 20-40 = .3 40-90 = .5 90-99 = .9 100 = 1.0		
Percent woodland divided by percent grassland-crops within 200 ft of the site (p. 71)	0.1	<.1 = .1 0.1-0.8 = .6 0.8-1.2 = 1.0 1.2-2.0 = .6 >2.0 = 1	0.1	at-P
Distance (ft) to nearest busy road (p. 71)	5000'	<100 = 0 100-300 = .3 300-600 = .5 600-1200 = .7 1200-2400 = .8 2400-4800 = .9 >4800 = 1.0	1	bw-G at-N v-P sb-R
This includes a) any road or parking lot in a develop area that contains >4 buildings per acre, b) any road with a maximum traffic rate of > 6 vehicles per minute, during an average day during the summer				



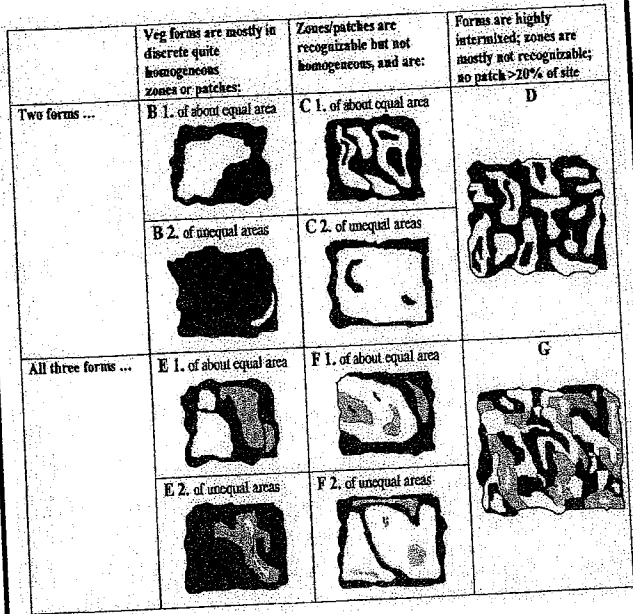
Note: The following 5 rows must sum to 100%. The number of visitors is immaterial.

Percent of site including 100-ft buffer that is visited 365 days a year or almost so =	5
Percent of site including 100-ft buffer that is visited more than 80 days a year (>20% of year), but less than daily =	
Percent of site including 100-ft buffer that is visited 20-80 days a year (e.g., about once a week) =	
Percent of site including 100-ft buffer that is visited just a few days a year =	95
Percent of site including 100-ft buffer that is almost never visited =	0

Scale the calculated value in the box on the right (sum of the above 5 rows) and enter the scaled value in column D (p. 72)	385	100-200 = 0 200-300 = .3 300-400 = .7 400-500 = 1.0	0.7	bw-H v-O sb-Q
Percent of site affected by soil leveling (i.e., portion previously leveled by equipment for farming)	0	100 = .1 10-99 = .3 1-10 = .6 0 = 1.0	1	at-C i-G pp-D sp-F n-H
Percent of site currently affected by soil compaction: (i.e., by equipment, vehicles, livestock, humans, fill) 6 = recent, at >90% of site 5 = recent, at 10-90% of site 4 = recent, at 1-10% of site 3 = >5 years ago, >90% of site 2 = >5 years ago, 10-90% of site 1 = >5 years ago, 1-10% of site 0 = none	3	5/6) = .1 4) = .2 3) = .4 2) = .6 1) = .8 0) = 1.0	0.4	sp-G v-M sb-K
Percent of site's vegetation that is mowed or subject to extreme grazing at least annually (p. 81)	none	>90 = 0 10-90 = .2 1-10 = .4 none = 1.0	1	sb-L v-N
Most of site is burned, or harvested for hay or timber, at least biennially? (p. 72)	no	no = 0 yes = 1.0	0	n-J
Percent of site currently affected by soil mixing (plowing, excavation, bulldozing, etc.): (p. 81) 6 = recent, at >90% of site 5 = recent, at 10-90% of site 4 = recent, at 1-10% of site 3 = >5 years ago, >90% of site 2 = >5 years ago, 10-90% of site 1 = >5 years ago, 1-10% of site 0 = none	3	5 or 6 = .1 4 = .2 3 = .4 2 = .6 1 = .8 0 = 1.0	0.4	at-f i-H v-L pp-A n-C sp-E
Percent of the site that is vegetated (including submersed aquatics) (p. 82)	100	<10 = .1 10-20 = .2 20-40 = .4 40-60 = .6 60-80 = .8 >80 = 1.0	1	sb-A v-A

Percent of site with woody vegetation (p. 82)	0	<10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	0.1	sb-b
Percent of seasonal zone that is bare during most of the dry season. (i.e., devoid of vegetation, except trees) (Answer "0" if no seasonal zone)	0	>80 = 0 60-80 =.2 40-60 =.4 20-40 =.6 1-20 =.8 0 = 1.0	1	pp-G sp-H
Percent of site that is inundated permanently and contains emergent, floating, or submersed plants (p. 72)	0	0 = 0 1-10 =.9 >10 = 1.0	0	i-A
Percent cover of herbs within the seasonal zone (p. 72)	0	0 = 0 1-10 =.4 10-30 =.8 30-60 = 1.0 60-90 =.9 >90 =.6	0	bw-F
Percent cover of herbs within the seasonal zone (p. 72)	100	0 = 0 1-30 =.1 30-50 =.6 50-70 =.75 70-100 = 1.0	1	at-L
Percent of whole site that has closed canopy (p. 80)	1	<10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	0.1	sb-C
Percent understory shrub & vine cover beneath the drip line of trees (p. 82) (Answer "0" if no wooded areas)	1	<10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0	0.1	sb-D

Number & distribution of vegetation forms --- herbs, shrubs, trees. If only one form, answer "A". To count, the patch must comprise >0.5 acre or >5% of vegetated area. See p. 77 for enlargement of diagram.



F2  
 A = 0  
 B2 = .60  
 C2 = .65  
 B1 = .70  
 C1, D = .75  
 E2 = .80  
 F2 = .85  
 E1 = .90  
 F1 = .95  
 G = 1.0

0.85  
 pp-B  
 v-B  
 at-J  
 i-K  
 sb-H

Number of woody species (p. 82)

5  
 unwooded = 0  
 1-2 = .1  
 3-4 = .25  
 5-6 = .5  
 7-9 = .75  
 10-18 = .9  
 >18 = 1.0

0.5  
 sb-E

Number of native woody species (p. 78)

5  
 0 = 0  
 1 = .1  
 2-3 = .25  
 4-5 = .5  
 6-9 = .75  
 10-13 = .9  
 >14 = 1.0

0.5  
 v-F

Percent of woody species list consisting of species that are native (p. 78)

100  
 0 = 0  
 1-57 = .1  
 58-66 = .25  
 67-74 = .5  
 75-79 = .75  
 80-99 = .9  
 100 = 1.0

1  
 v-g

Percent of woody cover within stratum that is comprised of non-native species (p. 82)

(Use the greater of the tree, understory shrub, or open shrub stratum's percent)

0  
 100 = 0  
 80-99 = .1  
 30-79 = .25  
 10-29 = .5  
 5-9 = .75  
 1-4 = .9  
 0 = 1.0


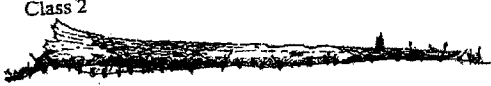

1  
 v-H

Spatial predominance of non-native herbs (p. 84)

A = Non-natives predominate  
 B = Cannot determine (about equal)  
 C = Natives predominate

c  
 A = 0  
 B = .5  
 C = 1.0

1  
 v-D

Percent of herb species list comprised of species that are non-native (p. 80)	10	100 = 0 80-99 = .1 67-79 = .25 60-66 = .5 25-59 = .75 1-24 = .9 0 = 1.0	0.9	v-E
Average diameter (inches) of the 3 largest trees. (p. 71)	0.4	none = 0 1-5 = .1 6-9 = .25 10-17 = .5 18-25 = .75 26-35 = .9 >35 = 1.0	0.1	sb-G v-J at-I n-F
Number of deadwood types. Potentially 12 types: (p. 77) ___ Class 1: freshly fallen, have bark & branches, 4-8" ___ Class 1: freshly fallen, have bark & branches, 8-20" ___ Class 1: freshly fallen, have bark & branches, >20" ___ Class 2: mildly rotted and mostly on ground: 4-8" ___ Class 2: mildly rotted and mostly on ground: 8-20" ___ Class 2: mildly rotted and mostly on ground: >20" ___ Class 3: well rotted, losing shape: 4-8" ___ Class 3: well rotted, losing shape: 8-20" ___ Class 3: well rotted, losing shape: >20" ___ Standing stumps/snags: 4-8" ___ Standing stumps/snags: 8-20" ___ Standing stumps/snags: >20" ___ Artificial debris - check only if no others present  <div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="margin-bottom: 10px;">                     Class 1   </div> <div style="margin-bottom: 10px;">                     Class 2   </div> <div>                     Class 3   </div> </div>	0	0 = 0 1 = .1 2 = .25 3-4 = .5 5-7 = .75 >7 = 1.0	0	sb-F v-I n-E at-H
Land cover in the vicinity of the site in the 1850's was wooded?	0	1 = Yes 0 = No	0	n-K pp-H at-R sb-S v-S

## Exhibit D

### Crediting and Debiting Procedure for the Bank

#### Crediting Methods

The Oregon Department of State Lands mitigation ratios for mitigation banks will be used to establish the number of credits available at a mitigation bank. These ratios can be found at: OAR 141-85-0425.

**Credit Table (Approximate Acreages)**

Method	Area (acres)	Ratio	Credits
Restoration	1.5	1:1	1.5
Enhancement of Cropped wetland	80.0	2:1	40.0
Preservation			
Buffer			
<b>Total</b>	<b>81.5</b>		<b>41.5</b>

**Credit Release Schedule**

Credit Release Number	# Credits Available	% Credits released	# Credits released	Release Criteria
<b>#1 Uncertified</b>	<b>41.5</b>	Up to 15%		<ol style="list-style-type: none"> <li>1. MBI Approved</li> <li>2. Restrictive Covenant Recorded</li> <li>3. As-built submitted/approved</li> <li>4. Proof of Financial Assurance (DSL requirement only)</li> <li>5. Estimated release date June 2008</li> </ol>
<b>#2 Uncertified</b>		Up to 30%		Same as uncertified credit release #1 plus <ol style="list-style-type: none"> <li>1. Planting completed as described in Exhibit C, Section IV.C)</li> <li>2. Estimated release date October 2008</li> </ol>
<b>#2 Certified</b>		Up to 50%		<ol style="list-style-type: none"> <li>1. Meet Performance Standards (includes hydrology)</li> <li>2. After one full growing season,</li> <li>3. Estimated release date July 2009</li> </ol>
<b>#3 Certified</b>		Up to 80%		<ol style="list-style-type: none"> <li>1. Meet Performance Standards</li> <li>2. After two full growing seasons</li> </ol>
<b>#4 Certified</b>		Up to 90%		<ol style="list-style-type: none"> <li>1. Meet Performance Standards</li> <li>2. After three full growing seasons</li> </ol>
<b>#5 Certified</b>		Up to 100%		<ol style="list-style-type: none"> <li>1. Meet Performance Standards</li> <li>2. Agreement secured with long term steward.</li> <li>3. Conservation Easement Signed</li> </ol> Assume this will occur so that Credit Release #4 and #5 will occur at the same time

**Note:**

**If no uncertified credits are needed, the financial assurance to be posted will be determined at the time of credit release. It will be based on the costs yet to be expended per the Projected Cost Table located in Section IX – Financial Assurances.**

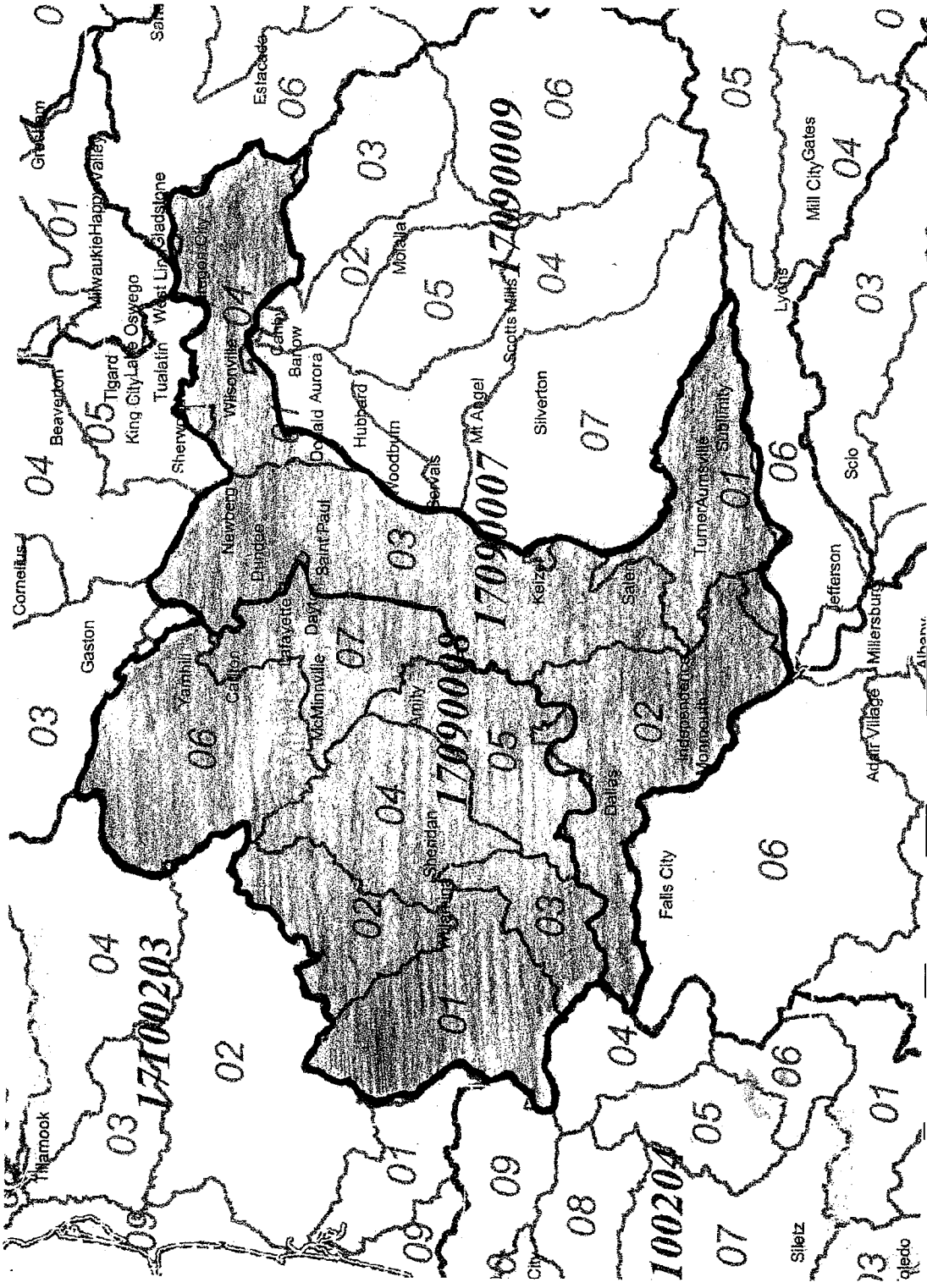
## **Exhibit E**

### **Service Area Map and Description**

The service area includes all of the 4<sup>th</sup> field hydrologic unit 1709007 (Middle Willamette) and 1709008 (Yamhill) within Polk, Marion, Yamhill and Clackamas Counties. The service area is limited to mitigation from wetland sites within this area at elevations at 600 feet or lower. And includes the Salem UGB and any expansion of the UGB until 2010.

The elevation of Phase 3 ranges between 178 and 190 feet msl. The 600 feet elevation limitation is designed to maintain mitigation from similar wetland elevations.

# Mud Slough Mitigation Bank



**Service Area Map**

The service area includes of all the hydrologic 4th fields units 1709007 and 1709008, at the 600 foot elevation or lower. This includes the Salem UGB and any expansion of the UGB until 2010.



Exhibit F

**Restrictive Covenant Language**

Mark Knaupp owner of the 81.50 acres located in Polk County, Oregon, of enhanced and restored wetlands located in T7S, R4W, Sec. 20, Tax Lot 300 as defined by professional land survey conducted and labeled AExhibit A@ hereto, makes the following declarations as to limitations, restrictions and uses to which the property described herein is now subject and specifies that such declarations shall constitute covenants to run with the land as provided by law and shall be binding on all parties and all persons claiming under them this declaration of restriction being designed for the purpose of keeping and maintaining portions of the real property described herein in their created wetlands state. The property subject to this Restrictive Covenant has been offered to the U.S. Army Corps of Engineers (ACOE) and Oregon Department of State Lands (DSL) to offset wetland loss or degradation at other locations, primarily in Polk, Marion and Yamhill Counties. This arrangement is defined in a Memorandum of Agreement dated July 8, 2008, allowing the Mud Slough Wetland Mitigation Bank to restore wetlands on this property and to sell credits to entities holding specific permits issued by the ACOE and DSL. This Covenant is executed to assure that the Protected Property will continue to fulfill that purpose and that it will be allowed to exist as wetland in perpetuity.

The property described herein, which is the creation of new wetlands shall, except as provided in AReserved Rights@ below be subject to the following:

1. There shall be no, destruction, cutting, trimming, mowing, alteration or spraying with biocides of any vegetation in the Protected Property, nor any disturbance or change in the natural habitat of the Protected Property in any manner, except to eliminate non-native species from the site, or conduct other required maintenance.
2. There shall be no agricultural, commercial or industrial activity undertaken or allowed in the Protected Property except for limited wetland plant seed harvesting; nor shall any right of passage across or upon the Protected Property be allowed or granted if that right of passage is used in conjunction with agricultural, commercial or industrial activity.
3. No domestic animals shall be allowed to graze or dwell on the Protected Property.
4. There shall be no filling, excavating, dredging, mining or drilling; no removal of topsoil, sand, gravel, rock, minerals or others materials, nor any dumping of ashes, trash, garbage, or of any other material, and no changing of the topography of the land of the Protected Property, once the wetlands is constructed, unless specified in the MBRT approved contingency plan approved by DSL and the ACOE.



5. There shall be no building of new roads or any other rights of way nor widening of existing roads on the Protected Property.

6. There shall be no damming, dredging nor any activities or uses of the Protected Property detrimental to water quality.

7. There shall be no operation of dune buggies, motorcycles, all terrain vehicles, or any other types of motorized vehicles on the Protected Property, except for monitoring, maintenance, and oversight purposes by the owner or his designee.

NEVERTHELESS, and notwithstanding any of the foregoing provisions to the contrary, the owners of the property reserves for themselves, their heirs, successors and assigns the following Reserved Rights; PROVIDED, however, that the exercise of such rights is not inconsistent with the conservation interests associated with the Protected Property.

### **RESERVED RIGHTS**

- 1) Any activities related to the initial or corrective measures or for long term maintenance of the wetlands, relating to construction, wildlife enhancement, planting, replanting, maintenance, trash removal, invasive weed or dominant species control may be conducted to insure compliance with the mitigation plan, based upon Oregon's Removal-Fill Law and the requirements of the Department of State Lands.
- 2) The Protected Property may be used for educational purposes. Activities may include soil or plant sampling, wildlife monitoring or other Aoutdoor classroom@ activities, to the extent that this use does not unduly alter the health of the protected area. The Protected Property may also be used for limited native seed harvesting.
- 3) Trails may be made through the upland habitat portions of the property using gravel, wood chips or other products normally used for trail development and upkeep. These areas may be provided with benches and/or raised walkways.
- 4) Emergency crossing of the protected property by farm equipment or other large equipment is allowed. Restoration of the site will be conducted for any damages that are incurred to the protected property.
- 5) The right to undeveloped recreational uses including limited hunting, fishing, and hiking for fee or gratis.
- 6) The right to prevent trespass and control access by the general public.
- 7) The right to install wildlife blinds for viewing and hunting.

**BURDENS**

Expenses relating to preservation of the Protected Property subject to the Covenant shall be allocated to and paid by the Owners of the Protected Property. These Burdens may be transferred to another entity by granting a Conservation Easement to allow that entity access to the Property and the Right to conduct such activities necessary to maintain the character and function of wetland on the Property.

This restrictive covenant entirely or in part may be terminated, amended, modified or revoked only upon written approval of the District Engineer of the Portland District of the U.S. Army Corps of Engineers and the Director of the Oregon Department of State Lands. To be effective, such approval must be witnessed, authenticated, and recorded pursuant to the law of the State of Oregon.

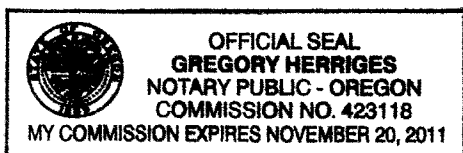
By: Mark Knauff  
Mark Knaupp

Dated this 3<sup>rd</sup> day of November, 2008  
State of Oregon  
County of Polk

Personally appeared the above-named Mark Knaupp and acknowledged the foregoing instrument to their voluntary act and deed. Before me this 3<sup>rd</sup> day of November 2008.

by Gregory H. Hedges

Nov. 20<sup>th</sup>, 2011 Notary Public for Oregon  
My Commission expires:



## Exhibit "A"

### PROPERTY DESCRIPTION

A tract of land located in the North West 1/4 and the South West 1/4 of Section 20, Township 7 South, Range 4 West, Willamette Meridian, Polk County Oregon, more particularly described as follows:

Commencing from the South 1/4 corner of Section 17, Township 7 South, Range 4 West, Willamette Meridian, Polk County, Oregon, thence South 89°49'56" West along the North line of said Section 20 a distance of 740.86 feet to the intersection of the West right-of-way of the Southern Pacific Railroad ( a 60 foot right of way ) **The True Point of Beginning**, thence South 89°49'56" West along said North line of Section 20 a distance of 1885.32 to a point, thence South 462.55 feet parallel with the West line of Section 20 and 19 to a point, thence South 90°00'00" East a distance of 371.86 feet to a point, thence South 77°57'28" East a distance of 115.00 feet to a point, thence South 69°10'41" East a distance of 200.00 feet to a point, thence South 50°23'50" East a distance of 175.00 feet to a point, thence South 31°05'12" East a distance of 150.00 feet to a point, thence South 3°12'34" East a distance of 110.00 feet to a point, thence South 0°55'35" East a distance of 450.00 feet to a point, thence North 89°03'57" East a distance of 470.00 feet to a point, thence South 89°57'51" East a distance of 315.00 feet to a point, thence South 88°57'28" East a distance of 275 feet to a point in the West right-of-way line of Southern Pacific Railroad ( a 60 foot right of way ), thence North 2°24'01" West along said West right-of-way line 1331.65 feet to the intersection of said North line of Section 20 **The True Point of Beginning**. Said tract contains 42.68 acres more or less.

#### Save and Except

A tract of land located in the North West 1/4 of Section 20, Township 7 South, Range 4 West, Willamette Meridian, Polk County Oregon, more particularly described as follows:

Commencing from the South 1/4 corner of Section 17, Township 7 South, Range 4 West, Willamette Meridian, Polk County, Oregon, thence South 89°49'56" West along the North line of said Section 20 a distance of 740.86 feet to the intersection of the West right-of-way of the Southern Pacific Railroad ( a 60 foot right of way ) **The True Point of Beginning**, thence 89°49'56" West along the North line of said Section 20 a distance of 510.32 feet to a point in said line, thence South 0°00'00" East a distance of 30.00 feet to a point, thence South 89°49'56" East a distance of 511.57 feet to a point in the West line of said Southern Pacific Railroad ( a 60 foot right of way ), thence North 2°24'01" West along said West right-of-way line 30.02 feet to the intersection of said North line of Section 20 **The True Point of Beginning**. Containing 0.35 acres, more or less

**Said tract contains, 42.33 acres, more or less.**

#### **Excepted from**

That property described as "Parcel III" in Polk County deed records reference document number 2007-2319.

## Exhibit "B"

### PROPERTY DESCRIPTION

A tract of land located in the North West 1/4 and the South West 1/4 of Section 20, Township 7 South, Range 4 West, Willamette Meridian, Polk County Oregon, more particularly described as follows:

Commencing from the South 1/4 corner of Section 17, Township 7 South, Range 4 West, Willamette Meridian, Polk County, Oregon, thence South along the North-South center section line South  $0^{\circ}10'48''$  East a distance of 10.00 feet to a point in said quarter section line, **The True Point of Beginning**, thence South along the North-South center of section line of said Section 20 South  $0^{\circ}10'48''$  East a distance of 2555.83 feet to a point in said North-South center of section line, thence North  $89^{\circ}49'30''$  West a distance of 180.00 feet to a point, thence South  $62^{\circ}40'17''$  West a distance of 75 feet to a point, thence South  $44^{\circ}06'41''$  West a distance of 432.39 feet to a point, thence South  $50^{\circ}23'05''$  West a distance of 120.000 feet to a point, thence North  $7^{\circ}16'08''$  West a distance of 82.70 feet more or less to a point in the east right of way of the Southern Pacific Railroad right-of-way ( a 60 foot right of way ), thence along the easterly right-of-way of said Southern Pacific Railroad (a 60 foot right of way ) a  $2^{\circ}$  counterclockwise curve to the left a distance of 629.97 feet to a point in said easterly right-of-way, thence North  $2^{\circ}24'01''$  West a distance of 2132.38 feet more or less to a point in said easterly right-of-way, thence North  $75^{\circ}35'41''$  East a distance of 81.31 feet to a point that is 10.00 feet south of the north line of said Section 20, thence North  $89^{\circ}49'55''$  East parallel with said north line of said Section 20 a distance of 600.83 feet to a point in said North-South quarter section line, **The True Point of Beginning**.

Said tract contains 39.18 acres more or less.

#### Excepted from

That property described as "Parcel III" in Polk County deed records reference document number 2007-2319.



1875 N. Greenwood Rd. Rickreall, OR 97371

Phone (503) 623-0768 Cell (503)559-0223 wetlandbank@msn.com

**RECEIPT**

Date: \_\_\_\_\_

DSL Permit # \_\_\_\_\_

Corps Permit # \_\_\_\_\_

Permittee Name \_\_\_\_\_

Address \_\_\_\_\_

Credits Purchased \_\_\_\_\_

Acres of Impact that Credits are being Purchased for \_\_\_\_\_

Impact HUC 4<sup>th</sup> field \_\_\_ 17090007 Middle Willamette \_\_\_ 17090008 Yamhill

Purchaser has paid the Bank the agreed upon price for the number of Wetland Mitigation Credits noted above.

By selling credits to the Permittee, Mud Slough Wetland Mitigation Bank is now the responsible party for fulfilling the mitigation aspect authorized by the following permits:  
DSL Permit # \_\_\_\_\_ Corps Permit # \_\_\_\_\_

By \_\_\_\_\_  
Mark Knaupp



## **Exhibit I**

### **Long Term Endowment Agreement**

The attached letter dated 1-11-08 from Ester Lev of The Wetland Conservancy, shows that a long term stewardardship for Phase 3 has been agreed to. The exact agreement documents will be provided to the MBRT prior to the release of the last 20% of the Phase 3 credits.




Mark Knaupp  
Mud Slough Wetland Mitigation Bank.  
1875 N. Greenwood Rd.  
Rickreall, OR 97371

January 11, 2008

Dear Mark:

The Wetlands Conservancy is pleased to continue and expand our relationship with Mud Slough Wetland Mitigation Bank. The Wetlands Conservancy will hold an easement on Phase 3 of the bank. Endowment funds for Phase 3 will be added to the Endowment funds for Phases 1 and 2.

  
Esther Lev  
Executive Director

**Exhibit I**