Wetland Mitigation Banking Instrument
for the
Marion Mitigation Bank
Marion, Oregon

Submitted to
Oregon Division of State Land
U.S. Army Corps of Engineers

Submitted by
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Wetland Mitigation Banking Instrument for the Marion Mitigation Bank near Marion, Oregon

EXECUTIVE SUMMARY

This Banking Instrument constitutes a contract between the Marion Mitigation Bank, LLC (the Sponsor) and the Oregon Division of State Lands (DSL) and the U.S. Army Corps of Engineers (Corps) to allow the Sponsor to conduct a private wetland mitigation bank. The Sponsor will restore, create, and enhance wetland resources on a site of approximately 57.82 acres (parcels 400 and 500, T9S, R2W, Sec 27) approximately 1.5 miles northeast of Marion, in Marion County, Oregon (Figure 1). The site has been actively farmed for more than 50 years. The Sponsor will be allowed to sell credits to those holding a valid permit from DSL and the Corps allowing off-site mitigation for unavoidable impacts within the Bank's service area. The Banking concept has no impact on the Oregon wetland removal and fill permit process, except that it provides an option to off-site mitigation. This option must be approved by the DSL Resource Coordinator and the Corps Project Manager before the credits may be purchased.

The service area (Figure 4) within which credits may be used to offset impacts includes a small portion of the Middle Willamette Watershed (2B, Oregon Water Resources Department, 1992). It is based primarily on soils, watershed boundaries, ecoregion boundaries, and elevation. It includes the upper Mill Creek and lower Santiam and Calapooia drainages. The Willamette River is the western boundary. The service area would include the valley bottom but exclude the wooded foothills (e.g., upstream of Mehama on the Santiam). It includes the communities of Salem, Stayton, Albany, Lebanon and others.

The Bank will generate approximately 36.33 credits (11.18 in Phase I, 10.71 in Phase II, and 14.43 in Phase III). The credits may be used to offset impacts to functions and values of Palustrine emergent, scrub-shrub, and forested wetlands (Cowardin classes) in the Mid-Willamette valley in shallow depression and flat settings (but not in riverine settings). The credits will typically be used to offset smaller wetland impacts (e.g., less than 5 acres) because restoration, enhancement, or creation of small wetland resources is difficult and rarely successful from an ecological perspective.

SITE DESCRIPTION

This Banking Instrument establishes an agreement between the Marion Mitigation Bank, LLC (the Sponsor) and the Oregon Division of State Lands (DSL) and the U.S. Army Corps of Engineers (Corps) to allow the Sponsor to develop a private wetland mitigation bank. The Bank site of approximately 57.82 acres has been ditched, drain tiled, and farmed for more than 50 years.

Location

The Bank site is approximately 1.5 miles northeast of the community of Marion in Marion County, T9S, R2W, Sec. 27 (Figure 1). The site is in the headwaters of Marion Creek, a tributary of the North Santiam River, in Hydrologic Unit 17090005 (USGS Hydrologic Unit Map for Oregon, 1974).

Former or Current Land Use

The site is in a moderately impacted landscape. Most alteration of this site and much of the Willamette valley has been caused by ditching and draining to convert natural wetlands to agriculture. These changes in land use and watershed function have seriously degraded wetland habitats throughout the valley. The agricultural development of this and surrounding lands over the past 100 years have removed and replaced native plant communities with commodity crops and pasture grasses.

Analysis of historic aerial photos (Appendix A) suggest that both wetland and upland habitat features on the site have been degraded by historic land uses. In 1948, although ditches were already apparent, some of the site was still scrub-shrub and forested wetland. Greater portions of the site were drained and cleared by 1955 and 1963. Part of the site may have been pastured. By 1970 a recently installed shallow ditch in the center of the site apparently allowed the most extensive cultivation of the site (1970, 1976). Cultivation of the northwest portion of the site apparent in 1970 and 1976 ceased sometime between 1976 and the present.

Approximately 55 of the total 57.82 acres have been cultivated or otherwise altered to raise grass seed, grapes, etc. The only chemicals applied were those consistent with the crops and other uses; application rates were within appropriate guidelines so there is little concern for any residual chemicals on site. There is no evidence and no reason to believe that any chemicals were stored on-site.

Water Quality Issues

Surface Water Quality

Deep ditches nearly surround the site so there is no likelihood of surface runoff from adjoining properties flowing onto the site. The mitigation design will retain water in depressions on-site so water quality improvement will occur on site and there is no concern for degrading surface water quality off-site.

Figure 1. General location map of the Marion Mitigation Bank site.

Ground Water Quality

The restoration strategy (regrading to create shallow depressions) will retain water on site and encourage recharge, thereby complementing the State's ground water management program (Dale Doremus, DEQ, pers. com.).

Assessment of Bank Site

A wetland delineation was conducted on site by Patrick S. Thompson Consulting on March 15 and 19, 2000 (Appendix B). DSL (Janet Morlan, pers. comm.) has concurred with the delineation. At present there is approximately 2.14 acres of emergent wetland, 7.68 acres of wet PC/farmed wetland, 16.50 acres of PC, and 31.50 acres of upland (Figure 2). The mapped soils (Figure 3) included Salem gravelly silt loam (non-hydric), Clackamas gravelly loam (non-hydric with hydric inclusions), Courtney gravelly silty clay loam (hydric), and Holcolmb silt loam (non-hydric). Most of the PC and wet-PC areas occur+red on the Courtney (hydric) soil, but some wetland soil inclusions (exhibiting low chroma and redoximorphic features) also occurred on the Holcolmb, Salem, and Clackamas soils that are typically considered non-hydric soils. Each of the habitat types has been sampled (Appendix C) to describe the present plant community in the cropped degraded wetland and prior converted cropland areas and to describe the plant community in the emergent wetland to be used as a basis for measuring restoration success.

Deep ditches that nearly surround the property and that drain the northwestern quadrant (Figure 2) have lowered the local water table approximately 4 feet. These deep ditches are along the north, east, and west property boundaries and one crosses the property from east to west (approximately 500 feet north of the south property boundary) connecting the east ditch to the west ditch. Shallow ditches also drain the shallow depressions in the center of the site (Figure 2).

Water levels (Table 1) in nine observation wells installed at the site (Figure 2), monitored since December 1999, confirm that the ground water levels were highest during the winter, and decline through summer and fall. During winter the water level ranged from 2 to 3 feet below land surface (except in well 9, where drainage of the site was least successful and water levels were at land surface). These data confirm that the water table has been lowered by the extensive ditching and tiling. Therefore, the restoration strategy will require excavation to the present water table.

Table 1. Depth to water (inches below land surface) in observation wells at Marion Mitigation Bank.

Date	Well No.	1	2	3	4	5	6	7	8	9
1999										
12-21		33	25	17	34	26	35	40	25	1
2000										
1-25		36	21	17	27	18	27	35	18	0
2-20		42	18	17	36	29	38	41	30	1
3-19		42	20	16	31	8	35	49	27	0
4-11		37	25	24	38	39	42	56	61	4
5-23		52	28	24	36	34	39	65	57	8
6-22		55	33	27	32	35	37	39	57	8
7-28		63	38	32	38	35	39	90	71	11

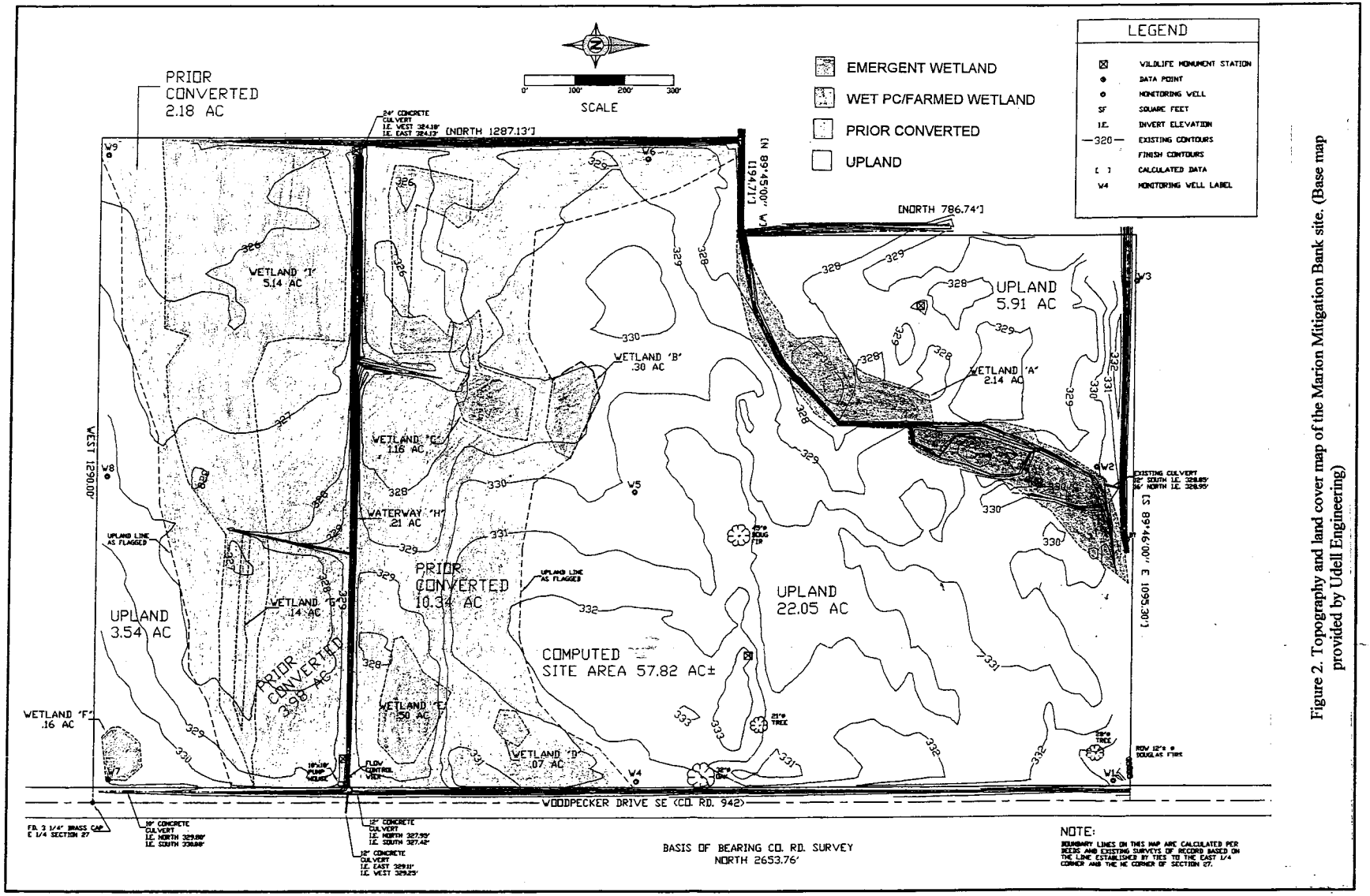

Figure 2. Topography and land cover map of the Marion Mitigation Bank site. (Base map provided by Udell Engineering)

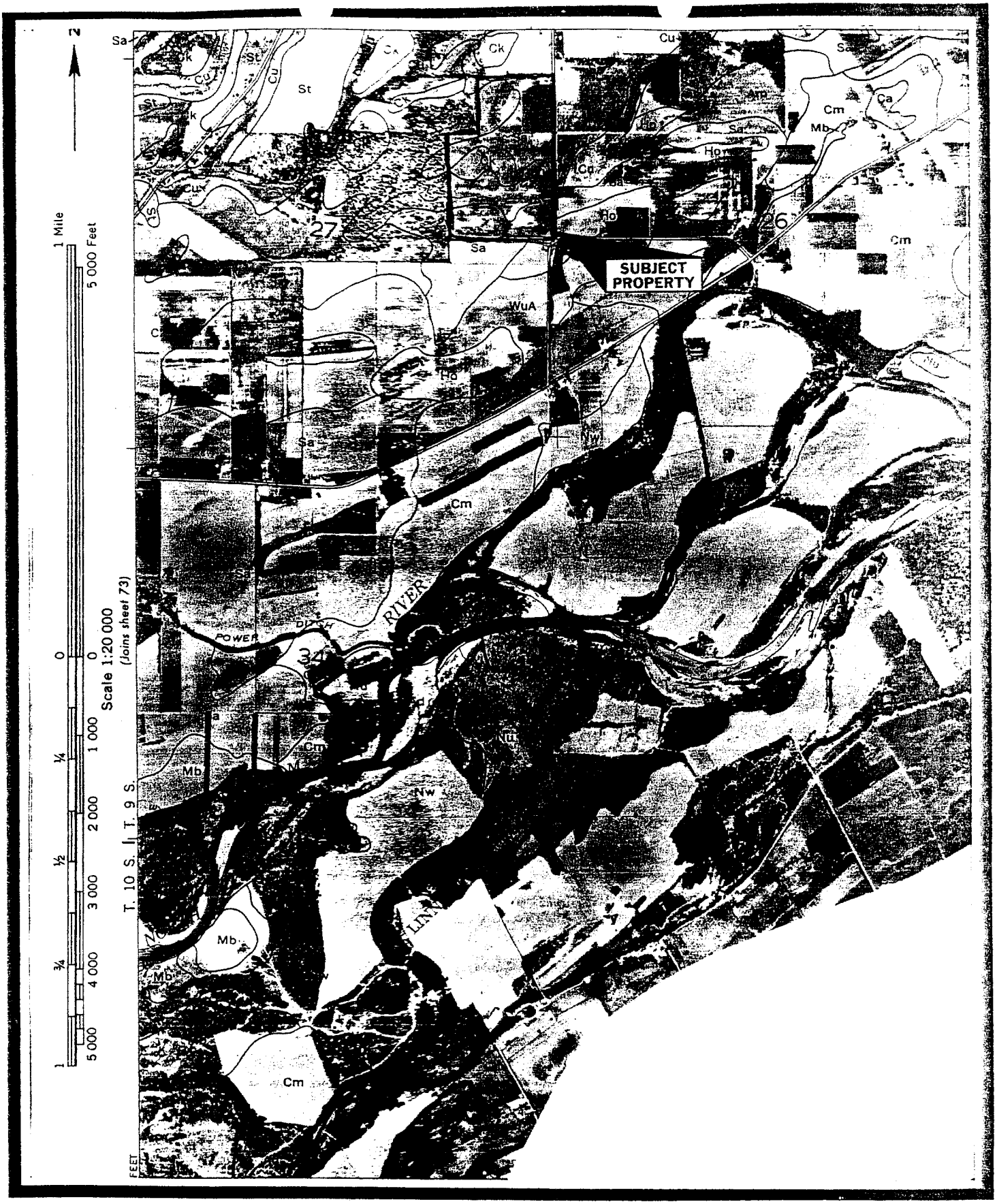

Figure 3. Mapped soil series at the Marion Mitigation Bank site.

OFWAM Assessment

The site was assessed in its current (pre-restoration) condition using the Oregon Freshwater Wetland Assessment Method, or OFWAM (Roth et. al. 1996). The OFWAM assessment confirms the site's value as habitat for some wildlife species and its degraded fish habitat, water quality, and hydrologic functions. The site is presently sensitive to future impacts and is not appropriate for educational use, recreation, or aesthetics. However, the site has high enhancement potential. The results of the OFWAM assessment are provided in Appendix D.

WET Assessment

The site was also assessed using the Wetland Evaluation Technique (Adamus et. al. 1987).The WET assessment confirms that because the site presently has almost no wetland characteristics its functions and values (Effectiveness) are mostly low or moderate, except for "Sediment/Toxicant Retention", which is high. The site's habitat value for waterfowl and wetland-dependent species are both low. The tabulated results are included in Appendix E.

Summary Assessment

In summary, this site is highly degraded but has great restoration potential. Proper restoration design will result in substantial gain in wildlife habitat, recreational, educational, and aesthetic values. Ground water recharge and discharge modification and water quality improvement functions will improve substantially as well.

PURPOSE OF THE BANK

Demonstration of Need

There is significant need for mitigation for wetland impacts in Salem and Albany and some need for mitigation in nearby communities (Stayton, Silverton, Aumsville, Marion, Jefferson). The Local Wetland Inventory (LWI) for the Salem area identified approximately 1200 acres of wetlands (270 forested, 59 scrub-shrub, 296 emergent, 65 farmed, and 531 ponds and gravel excavations). The partially completed LWI for Albany has already identified approximately 1400 acres of wetland, although only 40-50% of these are jurisdictional and likely to require mitigation (the remainder are prior converted). At present there may be need for more than 10 acres of mitigation per year for impacts in both the Salem and Albany areas. In addition there is need for several acres in nearby communities. Many of the impacts are small (fractions of acres) and on-site mitigation is impractical and unlikely to provide ecologically significant wetland habitat, so these are candidates likely to be served by mitigation banks.

Service Area

The service area boundary (Figure 4) includes a small portion of the Middle Willamette Watershed (2B, Oregon Water Resources Department, 1992). The boundary is based primarily on soils, watershed boundaries, ecoregion boundaries, and elevation. It includes the upper Mill Creek and lower Santiam and Calapooia drainages. The Willamette River establishes the western boundary. The Service Area includes the valley bottom but excludes the wooded foothills (e.g., upstream of Mehama on the Santiam). It includes the communities listed above.

Bank's Potential to Provide Function

Except for the small emergent wetland in the northwest portion, the site is intensively cropped and performs essentially no wetland functions. Approximately 50 acres of the site would be incorporated in restored, enhanced, or created wetland. These would include palustrine emergent, scrub-shrub, and forested wetlands with water regimes ranging from semi-permanent to temporarily-flooded (Cowardin classes) and hydrogeomorphic (HGM) flat and depression classes. The restored/created wetland will retain water on site (reduce runoff and hence reduce floods), enhance ground water recharge, provide wildlife habitat, improve water quality, increase primary productivity, and restore diversity and natural vegetation. The resulting wetland resource will provide a valuable habitat within the surrounding mosaic of agricultural lands, forests, and wetland habitats and will complement and provide connectivity to the relatively undisturbed forested areas left within the landscape.

MITIGATION STRATEGY

The mitigation design will restore the site to approximate historic wetland conditions. Most of the historic wetlands in this part of the Willamette Valley likely were created by the Santiam River as its channel wandered across the valley, constrained only by the valley walls. Wetland areas developed in abandoned channel segments (oxbows) left when the river created a new channel. To the west of this area the Santiam was constrained by the hills that extend from Marion to Salem, and historic aerial photos suggest that the abandoned channel segments trended approximately southwest-northeast. For decades, and perhaps for centuries, after oxbows are cut off from the river, topographic relief and depressions are preserved if the site is left undisturbed. On this site, agricultural activities, ditching, and draining have filled depressions and smoothed the land surface to facilitate crop production. We will regrade the site to emulate segments of abandoned river channels. The vegetation communities restored will be similar to the pre-development plant communities reported for wetland habitats in this part of the valley and to present-day plant communities in appropriate reference sites.

The site will be restored by plugging onsite ditches, removing drain tile, and regrading (excavating) to the local ground water table. The drain tile will be removed, crushed, or plugged during excavation. This design will assure that the restored wetland will be self-sustaining and require no ongoing activities to maintain site hydrology. Appropriate surficial soil material will be retained and subsequently redistributed in excavated areas to provide a seed source.

Ecological Goals and Objectives

The goal of this bank is to convert marginal farmland back to natural wetland resources to enhance diversity, provide wildlife habitat, and support natural wetland functions. The project will restore a wetland complex comprised of several habitat types that will include temporarily-flooded, seasonally-flooded, and semi-permanently flooded Palustrine emergent, scrub-shrub and forested habitats. The restoration will be successful (certified) when species richness (in herbaceous areas) and stem density (in scrub-shrub and forested areas) is at least 50% that of reference. However, ongoing management of the site will strive to achieve 75% species richness and 75% stem density (of reference) by the fifth growing season (it is expected that the density will increase annually until it peaks and then decreases as the site reaches maturity).

Effects of Adjacent Land Use

The site is in a largely agricultural setting where the surrounding land uses will have little impact on the restoration. The property to the north is pastured and will have no likely impact on the Bank site. (The north ditch also creates a boundary between the two properties.) The property to the east is partly cultivated and partly wooded and is separated from the Bank site by Woodpecker Drive and roadside ditches. The property to the south is comprised of a single family dwelling and agricultural fields and will have no likely impact on the Bank site. The property to the west is partly wooded and partly cultivated and will have no likely impact on the Bank site. (The west ditches create a boundary between that property and the Bank site.)

Reference Site

Data from the reference sites will be used to identify the desirable plants that can be expected to succeed at the mitigation bank site, the species richness, and the stem density in scrub-shrub and forested habitats. These data provide targets for the restored habitats at the bank site. The 0.32-acre "pond" noted within the 2.14-acre emergent wetland on Figure 2 will be used as reference for the expected herbaceous plant communities and wildlife usage that will occur in the restored areas; the Ankeny Wildlife Refuge or other nearby sites may also be used as reference sites; and data from an unpublished report of native vegetation in Willamette valley wetlands (Aaron Drew, USFWS, pers. comm) will also be consulted. Vegetation data and other data available from nearby USFWS sites and from the HGM program also will be used to the extent possible.

Site Mitigation Plan

The restoration design will be self-sustaining (requiring no hydrologic management activities) and will emulate abandoned river channel segments over the entire site (Figure 5). Figure 6 shows the present contours and the final grading plan. The restoration will be implemented in three phases. Phase I will restore approximately 15.6 acres south of the irrigation ditch that crosses the property from east to west. This will include restoration of farmed wetland, the irrigation ditch,

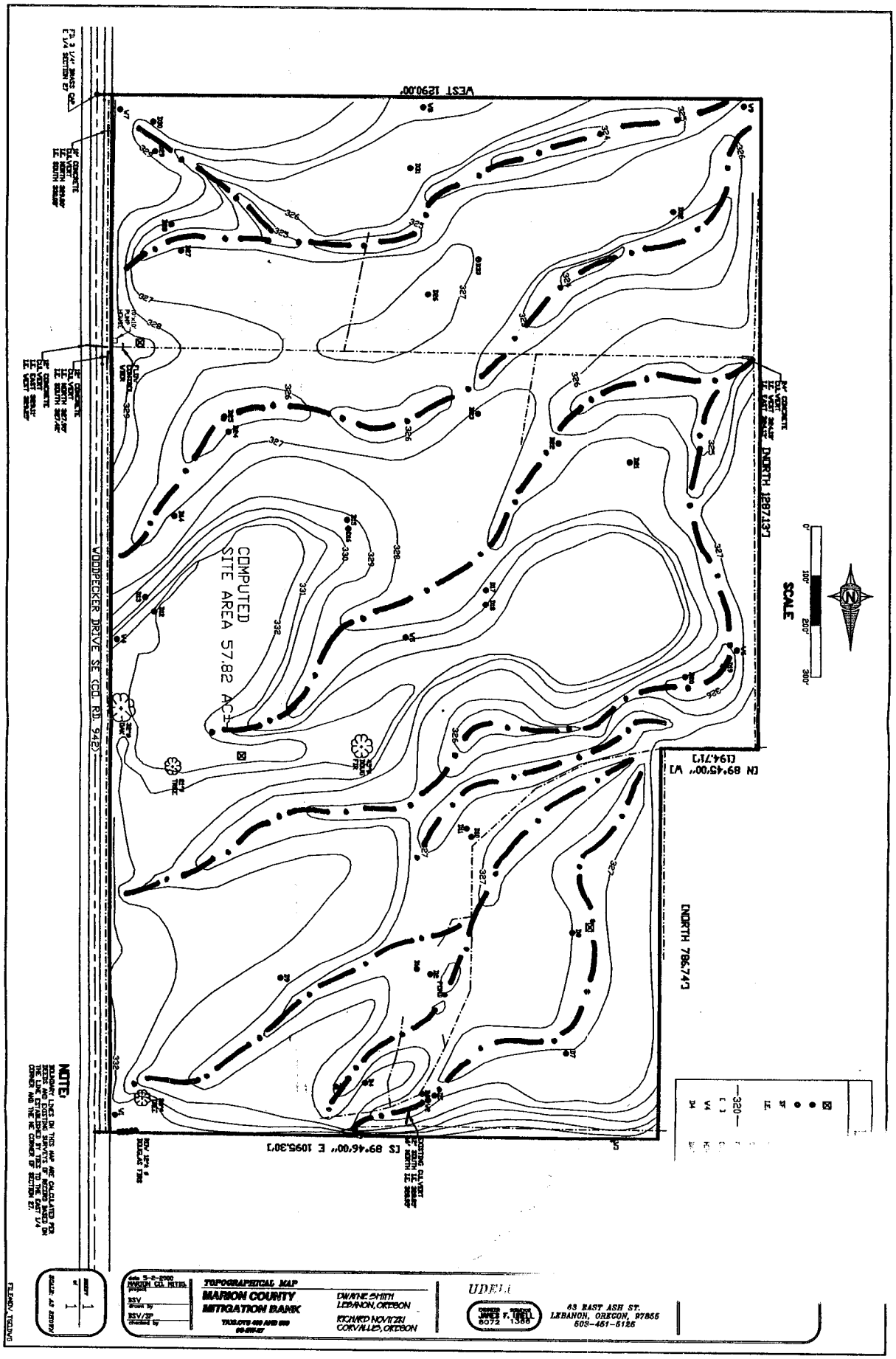

Figure 5.Closed, curvilinear, variable-depth depressions emulating abandoned channel segments at the Bank site. (Base map provided by Udell Engineering.)

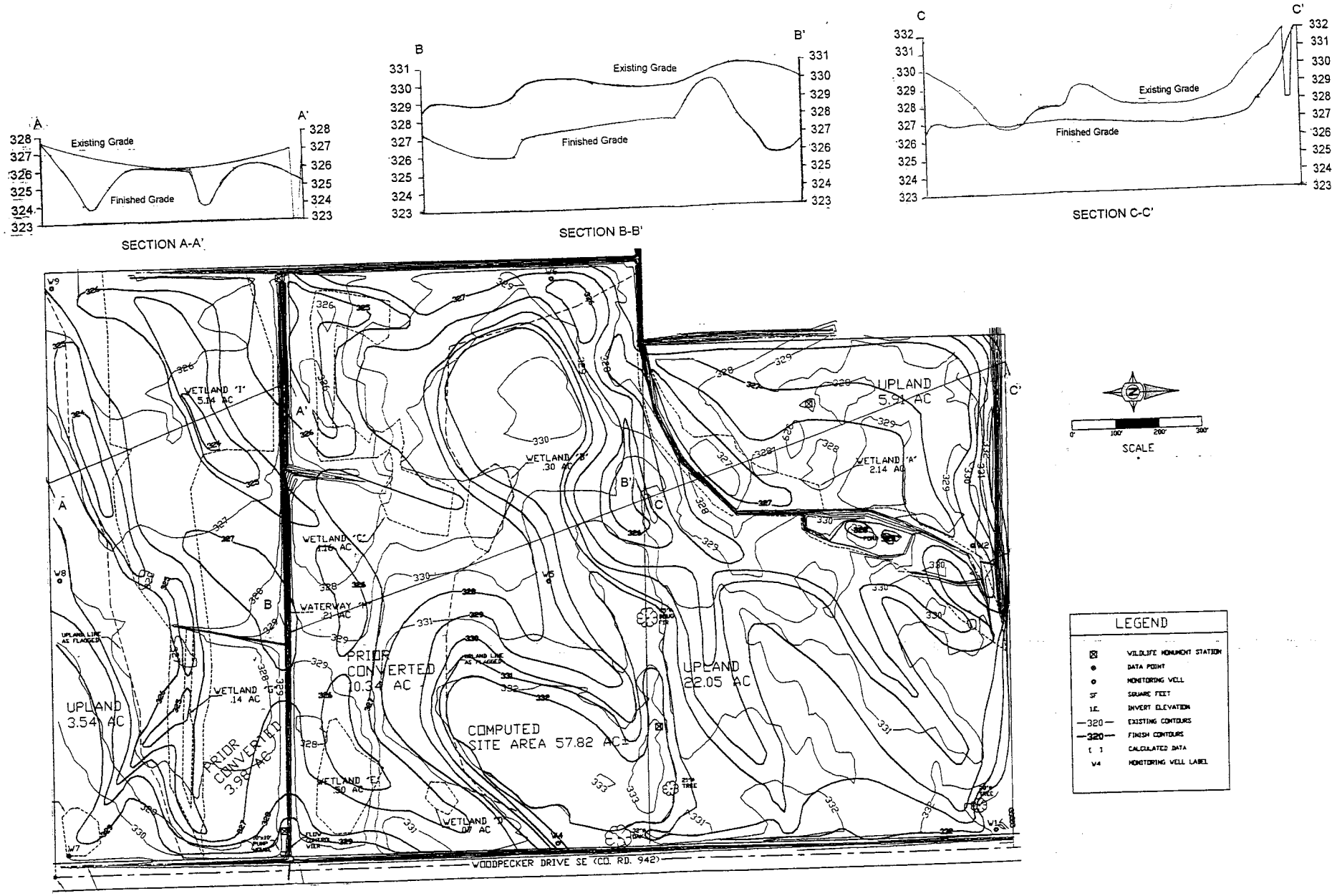

Figure 6. Grading plan and existing contours. (Base map provided by Udell Engineering.)

and PC areas and creation of wetland on the upland. Phase II will restore approximately 19.8 acres of the northern third of the site, including enhancement of the degraded wetland in the northwest quadrant and creation of wetland on the upland. Phase III will restore approximately 22.5 acres in the center of the site, including restoration of farmed wetland and the PC area and creation on the upland; part of the upland will be reserved for disposal of materials excavated during Phases I, II, and III. At this time we intend to complete all phases of the project within 3 years after the Instrument is signed. Restoration will include ceasing agricultural activities, reintroducing wetland vegetation, and controlling invasives.

Phase I

Cowardin Classes Restored

Phase I will restore approximately 15.6 acres south of (and including) the irrigation ditch. The restored habitats (Figure 7) will include Palustrine forested, shrub/scrub, and emergent habitats (Cowardin classes) and HGM flat and depression classes. The regrading (Figure 6) will provide approximately 6 acres of Palustrine forested wetland, 5 acres of scrub/shrub wetland, and 4 acres of emergent wetland.

Phase I Credits

5.65 acres enhanced wetland @ 2:1	2.82 acres credit
6.16 acres restored wetland @ 1:1	6.16 acres credit
3.30 acres created wetland @ 1.5:1	2.20 acres credit
0.50 acres upland buffer @ 10:1	0.05 acres credit

(Note: Credit for buffer areas will be available only after success criteria are met and at least 5 years after construction. The ratio of 10:1 is the maximum and it may be less, depending upon the level of success in achieving success criteria.)

Restoration Strategy

Phase I will regrade the area south of the irrigation ditch to create three curvilinear, variable-depth depressions emulating abandoned channel segments oriented approximately southwest-northeast (Figure 5). The center of the channel is the deepest part. The slope out from the channel to the edge of the depression will be variable but flat (e.g., greater than 1:50). The resulting wetland habitats will grade from semi-permanent water in the deepest part to seasonally flooded at the boundary between wetland and upland.

The conveyance capacity of the irrigation ditch will be maintained to assure that water provided by the Santiam Water District reaches downstream users undiminished, but the drainage of the site by the ditch will be eliminated. A 24" pipe (sized to accommodate the flow from the culverts delivering water to the ditch from across Woodpecker Drive) will be laid in the bottom of

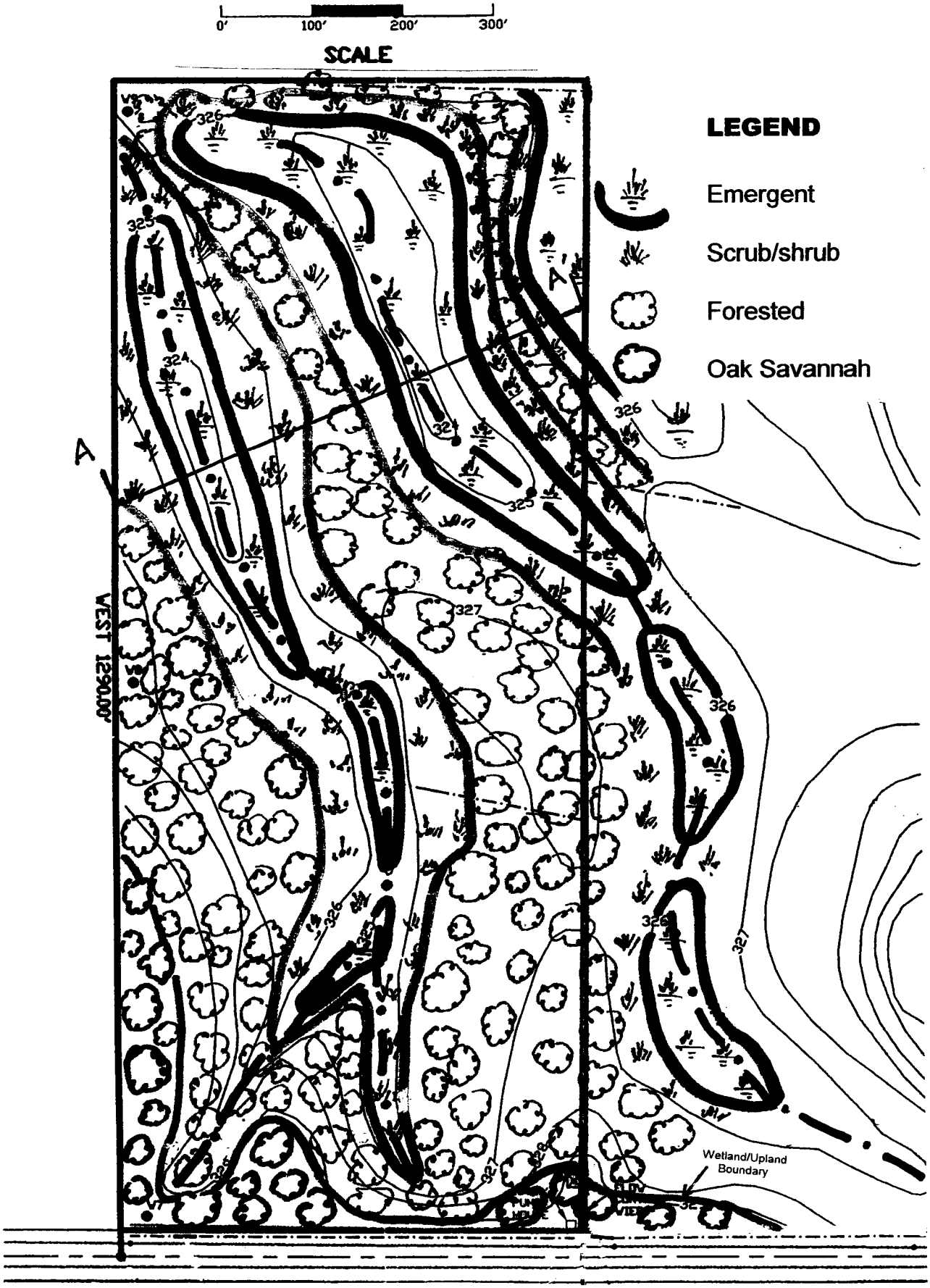

Figure 7. Phase I restoration and planting plan. (Base map provided by Udell Engineering.)

the ditch and the remainder of the ditch backfilled to grade. The pipe will be laid in the ditch crossing the site from east to west and will be continued in the ditch along the west side to the north and terminated where it will discharge west into the ditch crossing the adjoining property. Vertical risers, 24" in diameter, will be installed in the pipe midway along the east-west ditch and at the west side where the ditch turns to the north. These will allow access for inspection or maintenance and for irrigating newly planted areas if needed.

Excavated materials will first be used to fill the ditches and then placed in the disposal areas identified on Figure 5.

Planting Strategy

First, agricultural activities (planting and spraying) will cease. This will allow volunteer species contained in the seed bank to flourish. Herbaceous and woody species will be planted in the emergent, scrub-shrub, and forested habitats (Figure 7) as specified in Table 2. These species were chosen because they were found on site and because of their suitability to the soils and hydrology of the site, their wildlife habitat enhancement value, and their commercial and local availability. Seed, rhizomes, bare roots, etc. will be purchased from sources as close to the restoration site as practical (e.g., Salem, Albany). The species selected for the upland areas were suggested by James Cagun (pers. comm.) The woody species will be planted in clusters rather than evenly spaced, better emulating natural plant communities. Rhizomes and corms will be placed in zones, as appropriate, based on hydrologic conditions Seeds will be spread with a mechanical spreader approximately uniformly distributed through the habitat type.

Noxious Weed Control

Noxious weeds capable of forming monotypic communities are not common within the area of Phase I (except for a few Scots broom present on the north side of the irrigation ditch). We will conduct an active weed control program targeting especially Scots broom, reed canary grass, and Himalayan blackberry. Weed control will continue through the life of this Instrument.

Scots broom (Cytisus scoparius) Scots broom may sprout on the drier parts of the site. It will be controlled by cutting the stems in mid summer at the time of flowering and immediately painting the cut stump with full-strength glyphosate.

Reed canary grass (Phalaris arundinacea) Changes in the soil and hydrologic conditions may allow establishment of *Phalaris* seedlings. Local control of newly established seedlings will prevent spreading by rhizomes and distribution of seed. Clumps of canary grass will be sprayed with 0.75% isopropylamine glyphosate in late June. A nonionic surfactant will be added (0.5%) to the spray mixture to assure complete wetting of the foliage. When the plants have died and dried at the end of summer, they will be collected and burned, or burned in place.

Himalayan blackberry (Rubus discolor) and evergreen blackberry (R. laciniatus) Himalayan blackberry and evergreen blackberry may invade the drier parts of the site. These two species will be controlled by mowing extensive communities or spot spraying plants with a solution of 1.25% isopropylamine glyphosate in September after the brambles have fruited. A nonionic surfactant will be added (0.5%) to the spray to assure complete wetting of the foliage.

Purple loosestrife (Lythrum salicaria) If loosestrife appears, a 1% solution of isopropylamine glyphosate will be sprayed on the plants when they are in full bloom. A nonionic surfactant will be added (0.5%) to the spray mixture to assure complete wetting of the foliage. The plants will be left standing until they are completely dead.

Table 2. Planting list for Phase I.

Common name	Botanical Name	Form	Quantity	Status
Emergent Habitats				
Soft stem bulrush	*Scirpus validus*	rz	500	OBL
Slough sedge	*Carex obnupta*	rz	1000	OBL
Creeping spike rush	*Eleocharis palustris*	rz	200	OBL
Soft rush	*Juncus effusus*	rz	50	FACW
Jointed rush	*Juncus articulatus*	rz	200	OBL
Simple stem bur-reed	*Sparganium emersum*	sd	2 lbs	OBL
Flat sedge	*Cyperus erythrorhizos*	rz	500	OBL
Scrub/shrub Habitats				
Red alder	*Alnus rubra*	br	100	FAC
Sitka willow	*Salix sitchensis*	cu	500	FACW
Hard hack	*Spiraea douglasii*	br	1000	FACW
Tufted hair grass	*Deschampsia cespitosa*	sd	5 lbs	FACW
Slough grass	*Beckmania syzigachne*	sd	20 lbs	OBL
Western manna grass	*Glyceria occidentalis*	sd	5 lbs	OBL
Forested Habitats				
Oregon Ash	*Fraxinus latifolia*	br	3000	FACW
Black cottonwood	*Populus balsemifera*	br	500	FAC
Sitka willow	*Salix sitchensis*	cu	300	FACW
Hard hack	*Spiraea douglasii*	br	250	FACW
Upland (Oak Savannah) Habitats				
White oak	*Quercus garryana*	br	100	NL
Romer's fescue	*Festuca romeri*			
or				
Red fescue	*Festuca rubra rubra*	sd	100 lbs	NL
June grass	*Koeleria nidita*	sd	10 lbs	NL

rz=rhizome sd=seed br=bare root cu=cutting

Note: Species to be planted in wetland habitats are only those that are found on site. Upland species are those presumed to have occurred historically. Species are dependent upon availability at time of planting. If unavailable, or inordinately expensive, a suitable replacement will be substituted.

Phase II

Cowardin Wetland Classes Restored

Phase II will restore approximately 19.8 acres in the northern third of the site. The restored habitats (Figure 8) will include Palustrine forested, shrub/scrub, and emergent habitats (Cowardin classes) and HGM flat and depression classes. The regrading (Figure 6) will provide approximately 3 acres of Palustrine forested wetland, 5 acres of scrub/shrub wetland, and 9 acres of emergent wetland.

Phase II Credits

1.82 acres enhanced wetland @ 3:1	0.61 acres credit
15.16 acres created wetland @ 1.5:1	10.11 acres credit
2.50 acres upland buffer @ 10:1	0.25 acres credit

(Note: Credit for buffer areas will be available only after success criteria are met and at least 5 years after construction. The ratio of 10:1 is the maximum and it may be less, depending upon the level of success in achieving success criteria.)

Restoration Strategy

Phase II will regrade the northern part of the site to create three curvilinear, variable-depth depressions emulating abandoned channel segments oriented approximately southwest-northeast (Figure 5). These three segments will be in addition to the existing channel segment which will be preserved, although deepened and otherwise enhanced. (The existing channel segment presently contains the 0.32 acre reference wetland and 1.82 acres of degraded wetland dominated by reed canary grass.) The center of the channel is the deepest part; the depth will be adjusted based on results of the Phase I restoration strategy. The slope out from the channel to the edge of the depression will be variable but flat (e.g., greater than 1:50), again, adjusted based on experience gained during Phase I. Resulting wetland habitats will grade from semi-permanent water in the deepest part to seasonally flooded at the boundary between wetland and upland.

The ditches will be filled to design grade (Figure 6). These interior ditches were created only to drain the site and are not part of the irrigation ditch network. Therefore the ditches will be completely filled to prevent draining this portion of the site..

Excavated materials will first be used to fill the ditches and then placed in the disposal areas identified on Figure 5. Mature trees will be spared to the extent possible. Any trees, logs, or root wads resulting from construction activities will be placed in appropriate locations in the depressions (those created in Phase I or in Phase II, or reserved for placement in depressions created in Phase III) to contribute to habitat function and diversity.

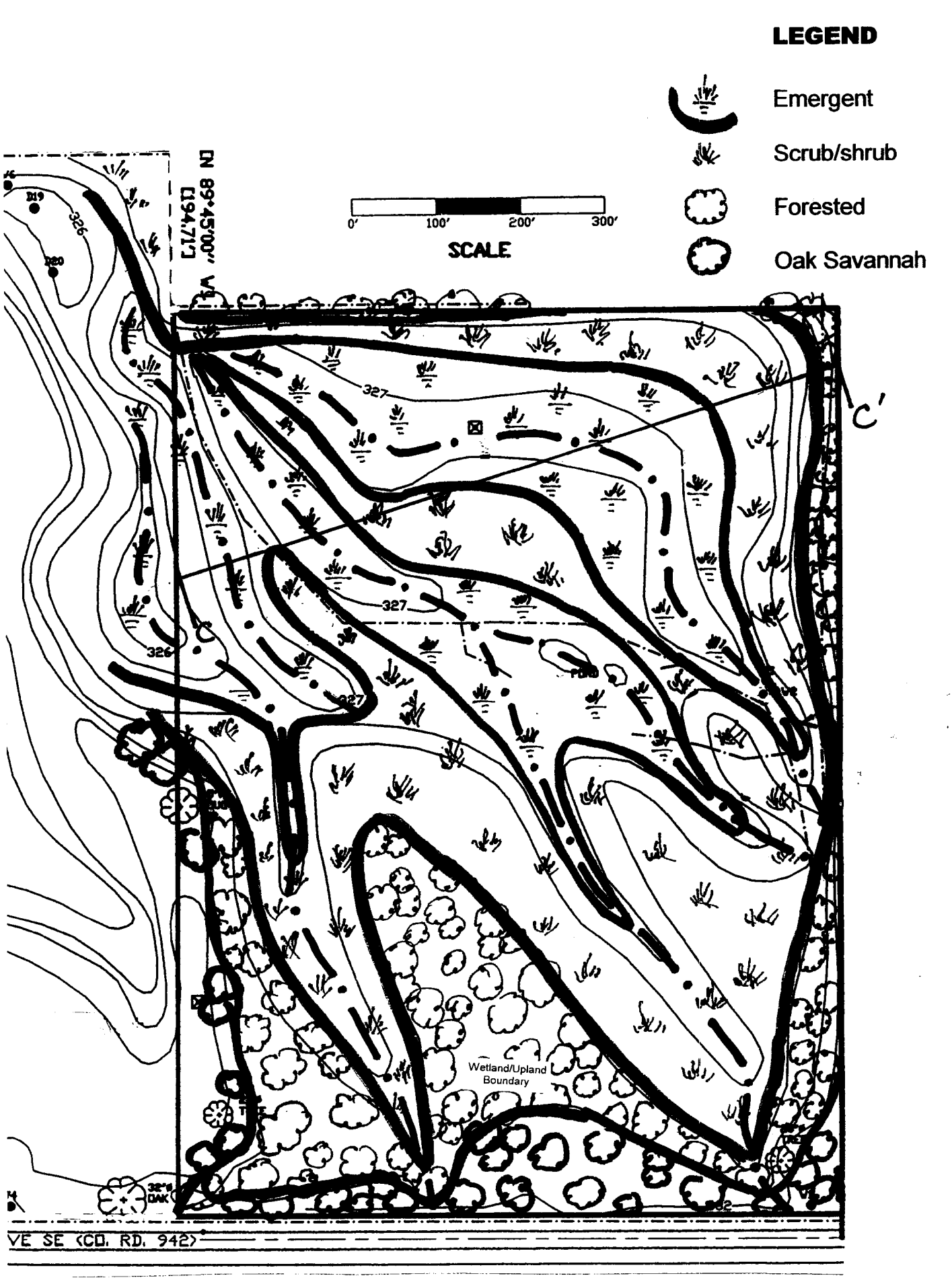

Figure 8. Phase II restoration and planting plan. (Base map provided by Udell Engineering.)

Planting Strategy

The reed canary grass and blackberry communities presently established within the wetland area will be removed during excavation and buried (this has been very successful in the mitigation bank in Wisconsin). Any invasives left on areas not excavated will be mowed and/or sprayed, as appropriate (see Noxious Weed Control section in Phase I). Herbaceous and woody species will be planted in the emergent, scrub-shrub, and forested habitats (Figure 8) as specified in Table 3. These species were chosen because they were found on site and because of their suitability to the soils and hydrology of the site, their wildlife habitat enhancement value, and their commercial and local availability. Any desirable species that emerge from the seed bank will be nurtured and encouraged to flourish.

Table 3. Planting list for Phase II.

Common name	Botanical Name	Form	Quantity	Status
Emergent Habitats				
Soft stem bulrush	*Scirpus validus*	rz	200	OBL
Slough sedge	*Carex obnupta*	rz		OBL
Creeping spike rush	*Eleocharis palustris*	rz	300	OBL
Soft rush	*Juncus effusus*	rz	200	FACW
Jointed rush	*Juncus articulatus*	rz	400	OBL
Simple stem bur-reed	*Sparganium emersum*	sd	2 lbs	OBL
Flat sedge	*Cyperus erythrorhizos*	rz	200	OBL
Scrub/shrub Habitats				
Red alder	*Alnus rubra*	br	100	FAC
Sitka willow	*Salix sitchensis*	cu	500	FACW
Hard hack	*Spiraea douglasii*	br	700	FACW
Tufted hair grass	*Deschampsia cespitosa*	sd	10 lbs	FACW
Slough grass	*Beckmania syzigachne*	sd	10 lbs	OBL
Western manna grass	*Glyceria occidentalis*	sd	10 lbs	OBL
Forested Habitats				
Oregon Ash	*Fraxinus latifolia*	br	1000	FACW
Black cottonwood	*Populus balsemifera*	br	300	FAC
Red alder	*Alnus rubra*	br	300	FAC
Sitka willow	*Salix sitchensis*	cu	800	FACW
Hard hack	*Spiraea douglasii*	br	300	FACW
Upland (Oak Savannah) Habitats				
White oak		br	100	NL
Romer's fescue	*Festuca romeri*			
or				
Red fescue	*Festuca rubra rubra*	sd	100 lbs	NL
June grass	*Koeleria nidita*	sd	10 lbs	NL

rz=rhizome corm=bulb sd=seed br=bare root cu=cutting

Note: Species to be planted in wetland habitats are only those that are found on site. Upland species are those presumed to have occurred historically. Species are dependent upon availability at time of planting. If unavailable, or inordinately expensive, a suitable replacement will be substituted.

Phase III

Cowardin Wetland Classes Restored

Phase III will restore approximately 22.48 acres in the middle of the site. The restored habitats (Figure 9) will include Palustrine shrub/scrub and emergent habitats (Cowardin classes) and HGM flat and depression classes. The regrading (Figure 6) will provide approximately 3 acres of Palustrine forested wetland, 5 acres of scrub/shrub wetland, and 9 acres of emergent wetland (5.00 acres are reserved for disposal area and access road).

Phase III Credits

2.03 acres enhanced wetland @ 2:1	1.02 acres credit
10.34 acres restored wetland @ 1:1	10.34 acres credit
4.61 acres created wetland @ 1.5:1	3.07 acres credit
0.50 acres upland buffer @ 10:1	0.05 acres credit

(Note: Credit for buffer areas will be available only after success criteria are met and at least 5 years after construction. The ratio of 10:1 is the maximum and it may be less, depending upon the level of success in achieving success criteria.)

Restoration Strategy

Phase III will regrade the area in the middle of the site to create three curvilinear, variable-depth depressions emulating abandoned channel segments oriented approximately southwest-northeast (Figure 5). One of these will connect to a segment created during Phase I and another will connect to a segment created during Phase II. The center of the channel is the deepest part. The slope out from the channel to the edge of the depression will be variable but flat (e.g., greater than 1:50). Each depression will grade from semi-permanent water in the deepest part to seasonally flooded at the boundary between wetland and upland.

Planting Strategy

Any reed canary grass or other invasives presently established within this area will be removed during excavation and buried or piled and burned. Any invasives on areas not excavated will be mowed and/or sprayed, as appropriate (see Noxious Weed Control section in Phase I). Herbaceous and woody species will be planted in the emergent, scrub-shrub, and forested habitats (Figure 9) as specified in Table 4. These species were chosen because they were found on site and because of their suitability to the soils and hydrology of the site, their wildlife habitat enhancement value, and their commercial and local availability. Any desirable species that emerge from the seed bank will be nurtured and encouraged to flourish.

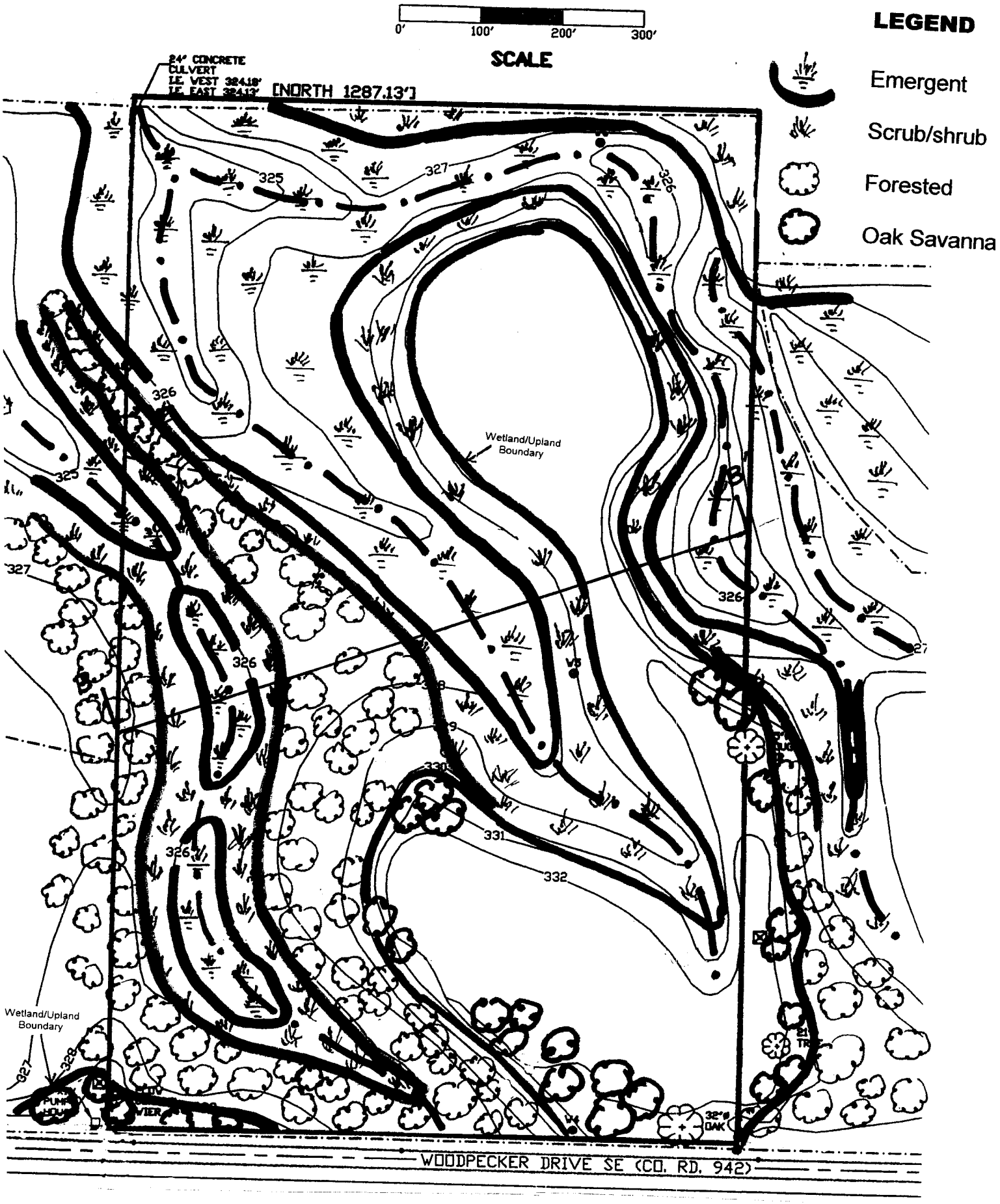

Figure 9. Phase III restoration and planting plan. (Base map provided by Udell Engineering.)

Table 4. Planting list for Phase III.

Emergent Habitats

Common name	Botanical Name	Form	Quantity	Status
Soft stem bulrush	*Scirpus validus*	rz	200	OBL
Slough sedge	*Carex obnupta*	rz	1000	OBL
Creeping spike rush	*Eleocharis palustris*	rz	300	OBL
Soft rush	*Juncus effusus*	rz	200	FACW
Jointed rush	*Juncus articulatus*	rz	400	OBL
Simple stem bur-reed	*Sparganium emersum*	sd	2 lbs	OBL
Flat sedge	*Cyperus erythrorhizos*	rz	500	OBL

Scrub/shrub Habitats

Red alder	*Alnus rubra*	br	100	FAC
Sitka willow	*Salix sitchensis*	cu	500	FACW
Hard hack	*Spiraea douglasii*	br	700	FACW
Tufted hair grass	*Deschampsia cespitosa*	sd	10 lbs	FACW
Slough grass	*Beckmania syzigachne*	sd	10 lbs	OBL
Western manna grass	*Glyceria occidentalis*	sd	10 lbs	OBL

Forested Habitats

Oregon Ash	*Fraxinus latifolia*	br	1000	FACW
Black cottonwood	*Populus balsemifera*	br	300	FAC
Red alder	*Alnus rubra*	br	300	FAC
Sitka willow	*Salix sitchensis*	cu	800	FACW
Hard hack	*Spiraea douglasii*	br	300	FACW

Upland (Oak Savannah) Habitats

White oak		br	100	NL
Romer's fescue	*Festuca romeri*			
or				
Red fescue	*Festuca rubra rubra*	sd	100 lbs	NL
June grass	*Koeleria nidita*	sd	5 lbs	NL

rz=rhizome corm=bulb sd=seed br=bare root cu=cutting

Note: Species to be planted in wetland habitats are only those that are found on site. Upland species are those presumed to have occurred historically. Species are dependent upon availability at time of planting. If unavailable, or inordinately expensive, a suitable replacement will be substituted.

Contingency Plan

The site will be under construction for three years and during that time it will be visited at least monthly. For the remainder of the terms of the Instrument (until five years after the last credit is sold) the site will be visited at least quarterly. During these visits, any problems will be noted and a plan to correct deficiencies developed and either implemented immediately or presented to the MBRT for approval, whichever is appropriate.

Success of planting will be noted each year and additional seed, plugs, or cuttings placed to replace unwarranted loss. However, if other desirable natural plants are out-competing the planted species, and the volunteer species are consistent with plant community targets developed from reference sites, the voluntary communities will be left undisturbed and the appropriate success criterion will be considered to have been met (adaptive management).

Site hydrology will be observed seasonally. Because the Bank will be developed in three phases, experience gained in earlier phases will be applied to later phases. Phase I hydrology will be evaluated to assure that wetland conditions have been restored as designed. If conditions are not as expected, the site will be regraded to achieve desired conditions (e.g., the deepest zones deepened; the sloped areas deepened or extended) and Phase II and III modified accordingly.

We have retained water rights so we could irrigate newly planted vegetation to promote planting success during extraordinary climate conditions.

R.P Novitzki and Associates, Inc. and Patrick Thompson, Consulting (Statement of Qualifications in Appendix H) will be involved with the site operation and maintenance throughout the life of the Instrument. Both of theses companies have successfully designed and developed wetland mitigation sites and banks throughout Oregon and in other States as well, and are well qualified to correct any deficiencies that may occur at this site. A performance bond of $30,000 has been secured as a source of funding to cover any corrective measures that may be required for Phase I. Once Phase I is successful, the bond may be transferred to subsequent phases, or increased, as required by DSL and the Corps.

SUCCESS CRITERIA

HGM has not been formally adopted in Oregon, but we are using an HGM-like approach for characterizing and subsequently for comparing plant communities at the Bank site to those at the reference site, those described in the unpublished data on native vegetation in Willamette valley wetlands, etc. We have also completed both OFWAM and WET assessments for the site, and will conduct these assessments again following site restoration.

Performance Standards

Vegetation

Each phase will be considered successful and certified when:

1) open water areas will have no more than 15% cover of undesirable invasive species [undesirable species include Eurasian watermilfoil *(Myriophyllum spicatum)*, hydrilla *(Hydrilla verticillata)*, purple loosestrife *(Lythrum salicaria)*, any canary grasses *(Phalaris sp.)* smooth cordgrass *(Spartina alterniflora)*, South American waterweed *(Elodea densa)*, and spartina *(sp.)*]

2) areas of herbaceous vegetation will be dominated (more than 50% cover and more than 50% frequency of occurrence) by desirable herbaceous wetland species (FAC or wetter) and plant associations, the species richness will be at least 50% as great as that of the reference; no more than 50% of the area will be dominated by one species; and they will have no more than 15% cover of invasive, undesirable herbaceous species*

3) scrub-shrub areas will have no fewer than 3 species of desirable shrubs and will have a stem density of planted trees and shrubs (or volunteers of desirable species) of at least 100 stems per acre or at least 50% of the density at the reference (whichever is greater); and will have no more than 15% cover of invasive, undesirable herbaceous species*

4) forested areas will have no fewer than 3 species of desirable trees and will have a stem density of planted trees and shrubs (or volunteers of desirable species) of at least 100 stems per acre or at least 50% of the density at the reference; and will have no more than 15% cover of invasive, undesirable herbaceous species*

*Undesirable species include the species in 1) above and any canary grasses (*Phalaris sp.*), purple loosestrife (*Lythrum salicaria*), Canadian thistle (*Cirsium arvense*), Scots broom (*Cytisus scoparius*), Himalayan blackberry (*Rubus discolor*), and tansy ragwort (*Senecio jacobaea*). Other species may be deemed undesirable by consensus of the MBRT in discussion with the sponsor.

5) upland (Oak Savannah) will have at least oak *(Quercus garryana)* and other desirable tree species (with a stem density of at least 25 stems per acre) and at least one desirable herbaceous species that covers 50% or more of the upland area. There will be no more than 15% cover of undesirable invasive species [undesirable species include any canary grasses *(Phalaris sp.)* Canadian thistle (*Cirsium arvense*), Scots broom (*Cytisus scoparius*), Himalayan blackberry (*Rubus discolor*), and tansy ragwort (*Senecio jacobaea)*]. These criteria will be used to demonstrate success after the required five years.

Hydrology

Each phase will be considered successful and certified when the restored, enhanced, and created areas meet the hydrology criteria as specified in the Corps of Engineers 1987 delineation protocols. In most years (i.e., 3 out of 5) forested habitats shall have a water table no more than 12 inches below the surface in mid-March, scrub-shrub habitats shall be flooded or saturated until mid-March, and emergent habitats shall be saturated or shallowly ponded for more than 60 days (i.e. end of April). Depth of water in selected ponded areas (staff gages) and in observation wells will be monitored monthly to verify that the restored areas meet the required hydrology criteria.

Certification

Certification for sale of remaining restoration credits (that portion retained until demonstration of success) will be requested by the Sponsor as soon as success can be demonstrated (e.g., after the first or subsequent growing seasons) for each of the phases of this restoration. Certification of credits for restored upland areas will be requested after five years or after success criteria are achieved, whichever is later.

Monitoring Frequency, Protocols, Expertise

A topographic survey will be completed after the construction associated with each phase to document physical changes to the site. The topographic survey, representative photos, and a discussion of the species planted, buffers created, and any other actions pertinent to the restoration, enhancement, or creation of wetland on the site (e.g., variations from original plan) will be documented and presented in a report to DSL, the Corps, and the MBRT within 60 days of completion of construction activities associated with each phase. This documentation will be provided before, or as part of, any requests for certification of Bank credits.

Hydrology

The hydrologic monitoring of groundwater levels in 9 observation wells and observations of depth of ponding in selected shallow depressions will be conducted bi-monthly and continued through the duration of this Instrument. These data will be used to document the hydrologic responses to site restoration.

Vegetation

Plant communities will be characterized once annually (early/late summer) using the protocols presented in the report by Niswander and Niswander (1997). Photos will be taken from selected points established as part of the survey. The plant community characteristics for each habitat restored will be compared annually to the plant lists determined for reference sites.

The survey protocol involves a stratified random sampling strategy. Because we will be restoring the site in phases, and because of the diversity and random distribution of the habitats

restored on the site, we will superimpose a uniform grid over the site to establish a population of sample points. We have selected a grid spacing of 10 meters. The origin of the grid will be the southeast property corner. (The grid is described in detail in the Vegetation Monitoring Report, Appendix C.) We will identify those grid points occurring within each habitat type and from each of those sub-populations we will select at random 10 sample points. The coordinates of each sample point will be recorded, and a steel pin will be driven into the ground to aid in recovery of the exact sample location. At each sample location a 1 meter x 1 meter quadrat is placed and herbaceous species occurrence and percent cover are recorded. Sampling is stopped when the species-area curve flattens out (more than ten quadrats may be required). Where shrub or tree strata exist, they are sampled in a ten-meter radius around the quadrat. Percent cover by shrubs/saplings is estimated and diameter at breast height (DBH) is measured for trees. Stem counts are taken for saplings and trees. Permanent locations will be identified for taking panoramic photographs of each habitat type (at present and after restoration).

Wildlife

Wildlife use of the mitigation bank site will be suggested by a wildlife survey conducted twice each year (spring: between May 15 and June 15; winter: between January 1 and February 1) during the life of this Instrument. Four census stations were selected (Figure 2) to characterize baseline conditions. One census station has been established at the edge of the wetland (reference site) in the northwest part of the bank site. Additional census stations may be added to represent additional habitat types as they develop over time. All individual birds, mammals, amphibians, and reptiles observed within 50 meters of the station during a 15 minute period from sunrise to four hours after sunrise are recorded. Birds flying over the census station and any wildlife observed (direct observations or evidence such as scat, tracks, etc.) while walking between census stations are recorded as observations, but separately from observations at the census stations. These protocols are presented in "Wildlife Monitoring: Lebanon, Oregon Mitigation Bank Site" by Steven and Angela Niswander (1997).

Reporting Frequency and Protocols

The results of the hydrologic monitoring, vegetation sampling, and wildlife surveys will be summarized and provided with the summary of credit activity to DSL and the Corps annually (in January). Hydrologic, vegetation, and wildlife data will be those collected from January through December. Hydrologic data will be provided in both tabular and graphic format to facilitate analysis of trends, comparisons among years, and comparison to reference sites. The data sheets for the annual vegetation sampling will be provided. A comparison of plant community composition in habitat types at the Bank site to those in similar habitat types at the reference sites will be provided. The data sheets and summary tables of wildlife observations for both the winter and spring surveys will be provided. A comparison of wildlife usage at the Bank site to that at the reference sites will be provided.

Monitoring, wetland delineation, and site assessment will be conducted by R.P. Novitzki and Associates, Inc. and Patrick Thompson Consulting (Statement of Qualifications provided in Appendix H).

REGULATORY REQUIREMENTS

Consistency of Mitigation Banking with Local Plans and Land Use Regulations

We have discussed the Mitigation Plan with Lisa Milliman, Marion County, and it has been determined to complement all appropriate County watershed plans, zoning requirements, and land use restrictions. We have also discussed the Mitigation Plan with Bob Hanson and Matt Thorburn, Marion County Department of Public Works and they are considering adding the site to the County's heritage preservation and parks programs. (These letters are in Appendix I). We have discussed the Mitigation Plan with Dale Doremus, DEQ, and the plan is consistent with the State's ground water management plan. The property is zoned EFU and wetland restoration is an allowed use outright. The Mitigation Plan has also been discussed with Rich Gebhart, Corps and with Steve Moser, DSL, and appears to be consistent with policies of both agencies. Steve has visited the site and considers it suitable replacement for wetland impacts in the Service Area.

Water rights are assigned to the property and will be retained. The flow of water provided by the Santiam Water District will be transported through the property and delivered, undiminished, to downstream users. The proposed regrading of the site will retain water on site and encourage ground water recharge, thereby complementing the State's ground water management program.

Compensatory Mitigation Plans for Non-Minor Projects

This Banking Instrument incorporates and addresses all specific items included in the DSL/Corps Mitigation Rules and Guidelines. A Wetland Enhancement/Restoration General Authorization and a similar request has been submitted to DSL to the Corps.

Proof of Ownership

Marion Bank LLC is the equitable owner of the 59.13 acre (legal description, 57.82 acres calculated) mitigation bank site, located on Woodpecker Drive, Marion, Oregon (T9S, R2W, Sec. 27, parcels 400 and 500, Marion County). A copy of the deed registration is provided in Appendix J.

List of Adjacent Property Owners

Beggs, Calvin L. and Mildred R.
13533 Woodpecker Dr.
Turner, OR 97392

Bold, William R. and CarolJean
7725 Hilton Ln. SE
Turner, OR 97392

Crosiar, George A. and Lucretia
(Tracy, Comyn LeRoy
8203 Shaff Rd.
Turner, OR 97392

Derksen, Denis H. and Rachel L.
13694 Woodpecker Dr. SE
Turner, OR 97392

Scheppke, Patricia A. et al
12793 Woodpecker Dr. SE
Turner, OR 97392

Scheppke, Patricia A. and Hobson
12793 Woodpecker Dr. SE
Turner, OR 97392

Tracy, Comyn LeRoy
803 Shaff Rd. SE
Turner, OR 97392

Withers, Earl and Doris J.
1675 Tumalo Ave. SE
Salem, OR 97301

Wood, Jodine and Daniel H.
13184 Woodpecker Dr.
Turner, OR 97392

Estimated Costs

Land Acquisition	$200,000
Site Surveys (initial; as-built)	$20,000
Consulting Fees	$50,000
Legal Fees	$10,000
Construction	$300,000
Design/Planting	$50,000
Total	$630.,000

Monitoring (annual cost)	$20,000

Proof of Financial Resources

Marion Mitigation Bank, LLC has acquired ownership of the property (Appendix J). The LLC has established a line of credit in the amount of $150,000 and a performance bond in the amount of $30,000 (Appendix K). The performance bond will be maintained for the life of this Instrument or until the credits are certified and appropriate success criteria have been met and the success of the site has been confirmed. The bond may be transferred from one phase to the next if the earlier phase is clearly successful, or it may be increased as successive phases are added. This decision will be made by DSL and COE after the completion of each phase.

Method of Credit Accounting

Credits available for sale will be certified by determining the number of acres of wetland that have been successfully restored at the bank site using the Corps of Engineers 1987 delineation protocols; the ratios for restoration, enhancement, and creation described above; and the success criteria described above.

Recognizing that ecosystem function and health is dependent on the interaction between wetland and associated uplands, and the need to buffer wetlands from adjoining incompatible land uses, additional credits for upland buffers will be at a ratio up to 10:1. These credits will be authorized for sale after 5 years and after success criteria are met.

The number of wetland mitigation acres certified using the above criteria, the total number of credits sold, the number of credits remaining available for sale, the individual permittees to whom credits have been sold, and the number of credits each permittee purchased will be reported annually.

The reports presenting results of monitoring and credit accounting will be submitted to DSL, the Corps, and to MBRT members by January 31 each year and will cover the period from January 1 to December 31 of the preceding year.

Time Periods Associated with Elements of the Banking Instrument

The terms of this Instrument will continue until 5 years after the last credit is sold. However, if the site achieves equilibrium, meets success criteria, and demonstrates self-sustainability sooner, the sponsors may petition DSL and the Corps to release them from further responsibility to actively manage the site.

The performance bond will be maintained for the life of the Instrument. However, when the success of the site and achievement of success criteria are confirmed, the Sponsor may petition DSL and the Corps to release them from this requirement earlier.

The terms of this Instrument may be changed during the life of the Instrument. Either the Sponsor, DSL, or the Corps may initiate a proposed change at any time. However, the change will only take effect if all three signatory parties agree to that change. It is understood that the MBRT serves as an advisory body to the DSL and Corps and may participate in any discussions that may result in changes to this Instrument. It is also understood that DSL and the

Corps may request periodic meetings, either at DSL or at the mitigation site or reference site, to discuss relevant issues.

Long Term Protection Measures

A deed restriction has been drafted and will be recorded in Marion County as soon as this Instrument is accepted. It is our intent to provide restoration that is self-sustaining and requires little or no subsequent hydrologic or physical management. However, management of the plant community (e.g., fire, weed control/spraying) may be required. We are discussing options with both the USFWS and Marion County Department of Public Works for transfer of responsibility for long-term management of the property to either of these agencies. Such management is consistent with the management responsibility and restoration programs of both USFWS and Marion County. After the completion of the terms of the Banking Instrument (or sooner with the agreement of DSL and the Corps) the land may be sold or otherwise transferred to an entity (e.g., USFWS, Marion County, or a private party) with the desire to maintain the wetland resource.

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