Appendix D

Ecological Restoration

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Contents

Abbreviations ..... D-iii
Measurement Abbreviations ..... D-iii
D.1.0 Ecological Restoration Monitoring D-1
D.2.0 Functional Monitoring D-1
D.2.1 Wetland Functional Monitoring D-2
D.2.2 Prairie Functional Monitoring D-3
D.2.3 Forest Functional Monitoring D-3
D.3.0 Wetland Mitigation Monitoring D-4
D.3.1 Amphibian Surveys D-4
D.3.2 Hydrologic Monitoring D-4
D.4.0 Implementation Monitoring D-6
D.5.0 Site and On-Site Disposal Facility Inspections D-7
D.5.1 Site Inspections Findings D-7
D.5.2 OSDF Inspection Findings D-8
D.6.0 Activities in 2016 ..... D-8
D.7.0 References D-8

Tables

Table D-1. 2015 Wetland Functional Monitoring Area Summary D-11
Table D-2. 2015 Prairie Functional Monitoring Area Summary D-13
Table D-3. 2015 Forest Herbaceous Functional Monitoring Area Summary D-15
Table D-4. 2015 Forest Woody Functional Monitoring Area Summary D-17
Table D-5. Wetland Functional Monitoring Comparison D-19
Table D-6. Prairie Functional Monitoring Comparison D-20
Table D-7. Prairie Vegetation Year-by-Year Floristic Quality Assessment Index (FQAI) Comparison D-20
Table D-8. Forest Functional Monitoring Comparison D-21
Table D- 9. Amphibian Monitoring Summary D-22
Table D- 10. Amphibian Index of Biotic Integrity D-23
Table D-11. Wetland Mitigation Hydrologic Monitoring Results D-24
Table D-12. Paddys Run Streambank Stabilization Implementation Monitoring Data Summary D-26
Table D-13. Central Quadrant Site Inspection Findings, January 2015 ..... D-27
Table D-14. South Quadrant Site Inspection Findings, February 2015 ..... D-28
Table D-15. East Quadrant Site Inspection Findings, February 2015 ..... D-29
Table D-16. West Quadrant Site Inspection Findings, February 2015 ..... D-30
Table D-17. 2015 OSDF Inspection Findings, March 11, 2015 ..... D-31
Table D-18. OSDF Inspection Finding, June 3, 2015 ..... D-32
Table D-19. OSDF Inspection Findings, September 2 and 3, 2015 ..... D-34
Table D-20. OSDF Inspection Findings, December 2, 2015 ..... D-35

Figures

Figure D-1. Ecological Monitoring Activities D-39
Figure D-2. Ecological Monitoring Survey Areas—Northwest Site Quadrant D-40
Figure D-3A. Wetland Area BAPW2 Hydrograph D-41
Figure D-3B. Wetland Area FPAW2 Hydrograph D-42
Figure D-3C. Wetland Area FPAW7 Hydrograph D-43
Figure D-3D. Wetland Area FPAW9 Hydrograph D-44
Figure D-3E. Wetland Area WM1W1 Hydrograph D-45
Figure D-3F. Wetland Area WM1W3 Hydrograph D-46
Figure D-3G. Wetland Area WM1W5 Hydrograph D-47
Figure D-3H. Wetland Area WM1W6 Hydrograph D-48
Figure D-3I. Wetland Area WM1W7 Hydrograph D-49
Figure D-3J. Wetland Area WM2W2 Hydrograph D-50
Figure D-3K. Wetland Area PRTW1 Hydrograph D-51
Figure D-3L. Wetland Area PRTW2 Hydrograph D-52
Figure D-3M. Wetland Area PRTW3 Hydrograph D-53
Figure D-4A. Central Quadrant Site Inspection Findings, January 2015 ..... D-55
Figure D-4B. South Quadrant Site Inspection Findings, February 2015 ..... D-56
Figure D-4C. East Quadrant Site Inspection Findings, March 2015 ..... D-57
Figure D-4D. West Quadrant Site Inspection Findings, December 2015 ..... D-58
Figure D-4E. 2015 OSDF Inspection Findings D-59

Abbreviations

AIBI	Amphibian Index of Biotic Integrity
CC	coefficient of conservatism
DOE	U.S. Department of Energy
FPA	Former Production Area
FQAI	Floristic Quality Assessment Index
NPP	North Pine Plantation
NRRP	Natural Resource Restoration Plan
NWE	Northern Woodlot Enhancement
Ohio EPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
PRT	Paddys Run Tributary
VIBI	Vegetation Index of Biotic Integrity
VIBI-FQ	Vegetation Index of Biotic Integrity–Floristic Quality
WM1	Wetland Mitigation Phase I
WM2	Wetland Mitigation Phase II

Measurement Abbreviations

cm	centimeter
m^2	square meter

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D.1.0 Ecological Restoration Monitoring

Ecological restoration monitoring at the Fernald Preserve in 2015 involved functional monitoring, implementation monitoring, and wetland mitigation monitoring. Wetland, prairie, and forest communities in the northern portions of the site were evaluated as part of functional monitoring. Implementation monitoring consisted of herbaceous surveys and woody survival for the Paddys Run streambank stabilization project. Amphibian surveys also occurred in selected wetlands. Figure D-1 shows the location of 2015 ecological monitoring activities.

Ecological restoration monitoring is required as a result of the natural resource damage settlement between the U.S. Department of Energy (DOE), Ohio Environmental Protection Agency (Ohio EPA) and U.S. Department of Interior. The *Fernald Preserve Natural Resource Restoration Plan* (NRRP) (State of Ohio 2008) specifies ecological restoration monitoring requirements. The *Wetland Mitigation Monitoring Report* (DOE 2012) included provisions to continue evaluation of wetland communities through the functional monitoring program. In addition to continuation of vegetation and amphibian surveys, water elevations continue to be monitored within mitigation wetlands.

D.2.0 Functional Monitoring

In 2015, functional monitoring was performed in Management Area A (Figure D-2) with monitoring of wetland, prairie, and forest communities. This approach is different from previous years when monitoring was conducted on a sitewide community basis, with wetland monitoring completed one year, prairie monitoring the next, and forest monitoring the third year. This new management-area approach instead of plant community approach is a result of the revised prairie management process that was undertaken in 2015 and ensures that restored areas are managed on a 3-year rotation.

Figure D-1 shows the location of 2015 ecological monitoring activities, including the functional monitoring areas that encompass Management Area A. Monitoring Area A includes nine wetland basins, nine prairie areas, and seven forest communities. For each prairie and forested area, 15 random 1 square meter (m^2) quadrats were surveyed for herbaceous vegetation during the growing season (April through September). Surveys were divided into three rounds of five samples to ensure coverage throughout the growing season. Additional 1,000 m^2 plots were used to collect woody data from forest communities. Species abundance and size data using diameter at breast height (DBH) measurements were collected in 2015.

Processes for calculating monitoring parameters are described in the *Ecological Monitoring Methods Plan and Procedures* (DOE 2015a). Wetland communities were surveyed via fixed grids as described in the *Wetland Mitigation Monitoring Plan* (DOE 2009). Quadrat and fixed grid locations within each monitoring area are identified in Figure D-2.

Past annual Site Environmental Reports have presented area-specific data summaries. For 2015, a single species list is provided with area-specific information identified in one summary table. This presentation allows a side-by-side comparison of monitoring areas. The data are presented as follows:

- Table D-1, 2015 Wetland Functional Monitoring Area Summary
- Table D-2, 2015 Prairie Functional Monitoring Area Summary
- Table D-3, 2015 Forest Herbaceous Functional Monitoring Area Summary
- Table D-4, 2015 Forest Woody Functional Monitoring Area Summary

Species richness data are used to calculate the percent native species, average coefficient of conservatism (CC), and Floristic Quality Assessment Index (FQAI) for each restoration area. The latest Ohio FQAI Database (Gara 2013) is used to determine nativity status and CC values. Cover class estimates were also obtained to evaluate the extent of vegetation establishment across restored areas. Results presented in Tables D-1 through D-4 indicated that several plants could not be identified to species. Nativity and CC value designations for these plants are made on a case-by-case basis. For example, there are a wide variety of CC values for native *Carex* species, so these plants would need to be identified to species level in order for a CC value to be assigned. In comparison, *Vitis* (grape vines) are often identified only to genus. The Ohio FQAI database assigns a CC of 3 for each of the three likely *Vitis* species in southwest Ohio; therefore, for the purposes of FQAI and nativity calculations, *Vitis* species in Table D-3 is considered native and assigned a CC of 3. This approach is applied conservatively so that there is no possibility of artificially inflating the calculations. If the plant is identified to genus level but there is uncertainty regarding CC values, the plant is not included in the calculations, and NDA (No Determination Available) is indicated on the table. Unknown species are counted as non-native but are not included in calculating average CC values.

D.2.1 Wetland Functional Monitoring

In 2013, Ohio EPA presented a more streamlined approach for wetland evaluation called the Vegetation Index of Biotic Integrity–Floristic Quality (VIBI-FQ) (Gara 2013). This index can be used in place of traditional VIBI to evaluate wetland quality. The revised methodology uses a 0–100 score by combining two separate 0–50 scoring metrics. The traditional VIBI methodology used 10 separate 0–10 scores to develop a 0–100 score. Ohio EPA demonstrated that there was a strong correlation between traditional VIBI and VIBI-FQ scoring (Gara 2013). Wetland monitoring results are summarized in Table D-1; multi-year comparisons are provided in Table D-5.

All basins meet native vegetation goals established in the NRRP, and native wetland vegetation is fully established across all basins surveyed. The results show a similar trend when comparing restoration areas through time, with strong improvement over baseline conditions. A general decline in floristic quality is noted when comparing VIBI scores through time. The average VIBI decreased in two restoration project areas: North Pine Plantation (NPP) and Wetland Mitigation Phase II (WM2) (Table D-5). This appears to be partially attributable to the establishment of native, invasive species. Lower average CC values indicate that more generalist species are becoming established in these areas. Percent nativity is sustaining, so species such as Canada goldenrod (*Solidago canadensis*) are becoming more dominant. For instance, relative cover of

Canada goldenrod in NPPW4 was nearly 12 percent in 2015 (Table D-1) but less than 4 percent in 2012 (DOE 2013, Table D-14). Management activities have focused primarily on control of non-native vegetation. A shift to focus on maintenance of water elevations within the wetlands and selective establishment of more conservative species may be warranted for new projects. At the same time, non-natives should continue to be controlled. Reed canary grass (*Phalaris arundinacea*) was observed in the FPAW5 wetland in 2015. This aggressive, non-native species is actively controlled onsite but was not observed in FPAW5 in 2012 (DOE 2013, Table D-23). If left unchecked, it could spread to other basins onsite.

D.2.2 Prairie Functional Monitoring

Prairie results are summarized in Table D-2, D-6, and D-7. As with the wetland communities discussed above, all areas surveyed are meeting the goals established in the NRRP. Native vegetation is fully established across all project areas. The multi-year summary comparison on Table D-6 shows sustaining conditions in the Former Production Area (FPA) and reducing quality in NPP. The marked decrease in the FQAI for NPP again appears attributable to an increase in native but common species. The relative frequency of Canada goldenrod increased from 8 percent in 2013 (DOE 2014, Table D-26) to 27 percent in 2015 (Table D-2). Also, there may be increased dominance of native grasses, thereby further reducing forb diversity. Only 19 species were recorded in 2015, compared with 31 species in 2013. Big bluestem (*Andropogon gerardii*) and switchgrass (*Panicum virgatum*) counted for 32 percent of all species recorded in NPPBR1.

The increased focus on prescribed burns has had a positive effect on the FPA prairie areas. Table D-7 compares FQAI scores for the past three monitoring sessions. FQAI values are relatively stable or increased between 2013 and 2015. Areas FPAA3A, FPAA3B, FPAA6A, FPAMDC, and a portion of FPAA6B were all burned in spring of 2015. The only area that showed a substantial decrease was NDASP7. This area was not burned in 2015, but rather mowed and interseeded. Again, it appears that generalist native species are increasing. The relative frequency for Canada goldenrod in NDASP7 was 10 percent in 2015, while only 4 percent in 2013 (DOE 2014, Table D-25). Conservative species such as compass plant (*Silphium laciniatum*) and cup-plant (*Silphium perfoliatum*) were present in NDASP7 2013, but were not present in 2015. In an effort to reverse this trend, these areas were interseeded with native grasses and forbs following spring mowing.

D.2.3 Forest Functional Monitoring

Tables D-3, D-4, and D-8 provide a summary of forest functional monitoring findings. As with the other areas surveyed across Management Area A, native species goals are met. Data from the NPP and the Northern Woodlot Enhancement (NWE) areas indicate improving conditions when compared to baseline conditions. Parameters are also improving in both areas in a comparison of data through time (Table D-8). Woody invasives control appears to be helping. For Area NWESF1, the relative density of amur honeysuckle (*Lonicera maackii*) was less than 29 percent in 2015 (Table D-4), compared with 34 percent in 2014 (DOE 2015b, Table D-49). Approximately 15 acres of amur honeysuckle in NWE were sprayed or physically cleared last year. As Table D-4 shows, honeysuckle was present in all forested communities surveyed. Woody invasives control will continue to be a focus at the Fernald site.

D.3.0 Wetland Mitigation Monitoring

Pursuant to the *Wetland Mitigation Monitoring Report* (DOE 2012), limited wetland monitoring continued in 2015. Activities included amphibian surveys to calculate Amphibian Index of Biotic Integrity (AIBI) and hydrologic monitoring using shallow wells (piezometers).

D.3.1 Amphibian Surveys

Amphibian monitoring was conducted in spring 2015 for selected basins within the mitigation wetlands. Table D-9 lists the amphibian species observed, and Table D-10 compares AIBI scores for each basin since 2011. While calculating AIBI for 2015, an error was discovered. The relative abundance of tolerant and sensitive species had been improperly calculated since 2011. Table D-10 presents corrected values for 2011 through 2014 along with the 2015 results.

Results indicate that mitigated wetlands established in the northern portions of the site are maintaining overall quality and function. Findings in 2015 were similar to those recorded in previous years with ambystomatid salamanders observed in wetlands that are located adjacent to established forest communities (NPP, Wetland Mitigation Phase I [WM1], and WM2 wetlands). The presence of ambystomatid salamanders is a key indicator of mitigation wetland success (Micacchion 2011).

While the northern wetlands (NPP, WM1, and WM2) continue to perform better than other areas, using the corrected values in Table D-10 indicate that the 2015 AIBI scores for all basins are generally lower than previous years with the exception of the Paddys Run Tributary (PRT) wetland. Many factors can be responsible for lower AIBI. Regional weather conditions could have had significant impact on salamander migrations. Mass migrations take place if conditions are suitable; however, drought, flooding, and extreme cold influence whether breeding will commence in any given year. Additionally, breeding periods are extremely limited for pond-breeding salamanders. If surveys are not conducted under ideal conditions within the short breeding period, the likelihood of adult salamander presence in funnel traps is greatly reduced. Furthermore, the site's mitigation wetlands have been providing sufficient habitat for salamander populations to migrate to and from their original breeding ponds. The proximity of restored wetlands to existing amphibian breeding ponds can greatly impact where ambystomatids select for a breeding site (Gara and Micacchion 2010). Over time, the site's mitigated wetlands have become more established, providing ambystomatids with more potential breeding sites to choose from. Given these factors, the presence of ambystomatids in any number ensures that mitigation efforts are providing adequate ecological services for sensitive indicator species.

The PRT basin was added to the amphibian monitoring program in 2013. As described above, the surrounding landscape can greatly influence habitat development in created wetlands. The PRT wetland is within 350 meters of a wooded wetland that has been ideal habitat for pond-breeding amphibians. Ambystomatids were observed during funnel trap surveys, resulting in a significantly higher AIBI score when compared with data from 2013 and 2014.

D.3.2 Hydrologic Monitoring

Hydrologic monitoring consists of daily water level measurements from shallow wells (i.e., piezometers) that were installed in 2009 and 2012. Figures D-1 and D-2 show the locations

of piezometers within site wetlands. Figures D-3A through D-3M provide hydrographs for each basin monitored in 2015. Table D-11 presents results for each piezometer by year. Hydrological monitoring has occurred in most basins for 6 years. The overall pattern of water levels in most basins is similar across the years, with saturated conditions observed through the winter and spring, followed by drier conditions in the summer and fall. These findings are also similar to those at other emergent wetlands in Ohio. The influence of surface water is evident, as spikes in water elevations are observed in most basins (Mack et al. 2004) following precipitation events in summer months.

Data are collected from transducers that are positioned inside the piezometers. Transducers collect data at approximately 90 centimeters (cm) below the ground surface. Data are uploaded from transducers at the most on a monthly basis, and usually only several times a year. Therefore, if a transducer fails there is the potential to miss periods of time for data collection. Significant data gaps can be observed on the hydrographs and are noted in Table D-11.

Table D-11 compares results to the performance standards established in the *Fernald Preserve Wetland Mitigation Monitoring Plan* (DOE 2009). Standards include the percent of time water is present in the root zone, the mean depth of water, and the flashiness index. The standard associated with saturation of the root zone is based on a root zone of 30 cm below ground surface where water is present a minimum of 53 percent of the time throughout the year. The mean depth to water must be less than 29.4 cm. The flashiness index is a measurement of how fast water elevations rise or fall and is calculated by taking the absolute value of the annual average difference between water elevations on consecutive days. For wetlands to meet the flashiness standard, the flashiness index must be less than 2.0.

DOE stopped collecting data in 2015 for wetlands that showed stable conditions for 5 years. As a result, monitoring continued in 13 basins in 2015. As Table D-11 shows, basins FPAW7 and WM2W2 have met the 5-year criterion, and DOE plans to discontinue hydrological monitoring of these two basins in 2016. All piezometers remain in the field, so they are available for future use if it is determined that monitoring should resume. An error was discovered in the calculation for percentage of time water from 2011 to 2013 for WM2W2, which led to an under reporting the percentage for these years. The corrected values are provided in Table D-11. These new values are consistent with field observations which indicate WM2W2 as a stable wetland that is actually drawn down in late summer in order to manage fish populations.

Several anomalies were observed with data collection in 2015. The water level in BAPW2 was recorded as being approximately 70 cm above ground level, which is much higher than in previous years (Figured D-3A). This appears to be associated with the transducer rather than field conditions, given that complete inundation of the wetland area was never observed. The transducer was replaced for 2016.

The hydrograph for basin WM1W6 indicates that water levels returned to normal when compared to 2014 data within this basin (Figure D-3H). In 2014, lower water levels were attributed to water loss due to headwall damage from burrowing crayfish. Repairs to the WM1W6 outfall are planned in 2016. Because repairs had not yet been made to the headwall, lower water levels were expected for 2015. Field observations show that the basin continues to be impacted by the outfall damage, so the 2015 monitoring results suggest transducer failure.

The transducer will be replaced in 2016, and hydrologic monitoring will continue in order to see if repairs have any effect on water elevations.

The three piezometers installed in the vicinity of the 2012 PRT restoration project still have not met performance standards. Field observations and amphibian monitoring results showed that water levels were maintained in the main vernal pool basin for the whole year. Hydrologic monitoring will continue in this area. Changes in hydrology may be observed due to the Paddys Run West restoration project. This project was completed in summer 2015 and involved expansion of wetland communities across the project area.

D.4.0 Implementation Monitoring

Implementation monitoring in 2015 consisted of an herbaceous plant survey and a woody vegetation survival survey in the Paddys Run streambank stabilization project area. Table D-12 provides the herbaceous summary data for this area.

Pursuant to the NRRP, seeded areas are evaluated for two criteria: percentage of native species and total cover. Implementation monitoring goals include at least 50 percent native vegetation establishment and 90 percent total cover by the end of the first growing season following seeding. Seeded areas are evaluated via random sampling. Five 1 m^2 quadrats are randomly distributed and surveyed. Field personnel estimate the total cover and list all species present within each quadrat. Total cover is estimated by assigning cover class categories for each quadrat. A cover class of 1 indicates that only one or two individual plants are present. A cover class of 10 represents 95 percent to 99 percent vegetative cover. The data collected are used to determine total cover, percent native species composition, and relative frequency of native species, pursuant to the *Ecological Monitoring Methods Plan and Procedures* (DOE 2015a).

For woody vegetation, all planted trees and shrubs are evaluated for survival at the end of the first growing season following installation. This involved an assignment of one of four categories: alive, resprouting, vital, and dead or unaccounted. Trees and shrubs are considered "alive" when their main stem and greater than 50 percent of the lateral stems are viable. "Resprouting" trees and shrubs have a dead main stem, with one or more new shoots growing from the stem or the root mass. Plants are categorized as "vital" when less than 50 percent of its lateral branches are alive. "Dead" trees have no signs of life at all. "Trees that are "unaccounted" are considered dead. Only "alive" trees are counted as surviving. The woody vegetation goal is 80 percent survival following the first growing season.

Two areas were surveyed in the Paddys Run streambank stabilization project area—the soil encapsulated lifts area and the regrade and fabric area. Both areas met native species goals but fell short of total cover goals. Most of these areas were covered with coir matting, which may hinder first-year total cover estimates. Visual observation of seeded areas showed that a combination of the coir matting and vegetation establishment have been successful in holding soil in place. No large-scale erosion has been observed within either area. Also, woody vegetation plantings within a portion of the Regrade and Fabric area were very dense, thereby lessening the impact from reduced herbaceous cover.

With respect to woody vegetation, significant mortality was observed across the project area. An overall count of tree survival was conducted pursuant to the methodology described above. Survival across the project area was approximately 27 percent. This was attributed primarily to the delay between receipt of plant material and installation. The project was planned to be completed in fall 2014. However, interim shutdown due to weather resulted in plant installation that was delayed until spring 2015. Some replanting occurred in fall of 2015, but widespread replanting was not necessary because a large number of volunteer trees and shrubs have become established within the project area. Observation of the Paddys Run streambank stabilization project will continue as part of the site inspection process.

D.5.0 Site and On-Site Disposal Facility Inspections

The *Fernald Preserve Comprehensive Legacy Management and Institutional Controls Plan* (DOE 2016) identifies the inspection process for the site and the On-Site Disposal Facility (OSDF). Inspections are conducted quarterly with participation from regulators. Inspections document evidence of unauthorized uses of the site, the effectiveness of institutional controls, and the need for repairs. Ecologically restored areas are evaluated for the presence of noxious weeds and erosion, the condition of vegetation, potentially contaminated debris, and signs of damage from nuisance animals. Section 6 of the 2015 Site Environmental Report provides a narrative summary of inspection results. Inspection reports are generated quarterly and are posted on the DOE Office of Legacy Management website, http://www.lm.doe.gov/fernald/Sites.aspx.

Follow-up maintenance activities are conducted to address findings from site and OSDF inspections. For a number of findings, it is determined that no action or continued monitoring is required. A number of 2015 inspection findings remain to be addressed. DOE continues to resolve older findings even as new ones are generated during inspections. Updated information is presented in quarterly inspection reports and in subsequent annual Site Environmental Reports.

D.5.1 Site Inspections Findings

In order to more easily manage the site inspections, the site was divided into four quadrants: central, south, east, and west. The field walkdowns are conducted by quadrant. The 2015 site inspection findings, resolution detail, and date of resolution are presented by quadrant in Tables D-13 through D-16. The approximate location of each finding is identified in Figures D-4A to D-4D. Similar to recent years, site inspection findings for 2015 consisted mainly of the presence of noxious weeds and invasive vegetation and deer fencing damaged by fallen trees and limbs. Minor erosion was observed in several locations within the Former Waste Storage Area. Site signage, fencing and access points are also inspected quarterly. Damaged or missing signs are occasionally noted and included in quarterly inspection reports.

Debris (e.g., asphalt, tile, concrete) continues to be identified, primarily in the FPA and Former Waste Storage Area. The site radiological control technician surveys all debris identified. DOE is committed to providing summary numbers regarding debris findings. In 2015, 453 pieces of debris were identified and removed. Thirteen pieces of debris removed had fixed radiological contamination above background levels. These debris items were located in areas of the site that are not open to the public.

D.5.2 OSDF Inspection Findings

OSDF inspections consist of a quarterly walkdown around the perimeter of the OSDF and an annual walkdown of the vegetated cap. Erosion rills, animal burrows, noxious weeds, woody vegetation, settlement cracks, and other indications that there may be an issue with the proper functioning of the cap are identified and repaired. In 2015, there were no signs that the integrity of the cap had been compromised. Findings consisted mainly of woody vegetation, noxious weeds, and animal burrows. Callery pear (*Pyrus calleryana*) and other woody vegetation continue to invade the OSDF cap in several locations. Field personnel physically remove these or apply herbicide to control establishment. Table D-17 provides the 2015 OSDF findings, resolution detail, and date of resolution, and Figure D-4E identifies the approximate location of each listed finding.

D.6.0 Activities in 2016

Activities in 2016 will include a continuation of the area-specific management and monitoring approach. Management Area B will be evaluated, which includes the southern half of the FPA, as well as all areas west of Paddys Run. Functional monitoring results for 2016 will include wetlands, prairies, and forest communities within these areas and will be presented in the Site Environmental Report for 2016. Wetland mitigation monitoring in the form of amphibian data collection and hydrologic monitoring in selected areas will also continue. Implementation monitoring will include an evaluation of the Paddys Run West restoration project.

Quarterly site inspections will continue to be used to identify issues that need to be addressed through restored area maintenance. In order to better access remote areas of the site, the timing of field walkdowns is focused in the winter months. This allows for greater visibility and access in densely vegetated areas.

D.7.0 References

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Table D-1. 2015 Wetland Functional Monitoring Area Summary

Wetland Area	Former Production Area				North Pine Plantation		Wetland Mitigation Phase II		
Basin	**FPAW2**	**FPAW4**	**FPAW5**	**FPAW7**	**NPPW4**	**NPPW5**	**WM2W1**	**WM2W2**	**WM2W3**
Total Species	36	42	58	21	62	54	45	59	44
Native Species	30	38	47	17	50	45	40	48	39
Non-Native Species	6	4	11	4	12	9	5	11	5
Native Species (Percent)	83%	90%	81%	81%	81%	83%	89%	81%	89%
Relative Cover of Native Species (Percent)	99%	94%	78%	65%	91%	95%	91%	96%	83%
Average Coefficient of Conservatism, range between 0-10	2.1	2.3	2.3	2.0	2.1	2.3	2.3	2.2	2.4
Floristic Quality Assessment Index	12.7	15.0	17.6	8.9	16.4	16.8	15.2	16.8	16.2
Vegetation Index of Biotic Integrity-Floristic Quality, range between 0-100	26	32	37	10	37	41	35	42	34

					Relative Cover (Percent)								
Scientific Name	**Common Name**	**Type**	**CC[a]**	**Wetland Indicator[a,b]**	**FPAW2**	**FPAW4**	**FPAW5**	**FPAW7**	**NPPW4**	**NPPW5**	**WM2W1**	**WM2W2**	**WM2W3**
Acalypha rhomboidea	RHOMBIC THREE-SEEDED MERCURY	forb	0	FACU					0.001%				
Acer negundo	BOX ELDER	tree	3	FAC						0.002%	0.002%	0.004%	0.002%
Acer saccharinum	SILVER MAPLE	tree	3	FACW								0.002%	
Acer saccharum	SUGAR MAPLE	tree	5	FACU								1.3%	
Agrimonia parviflora	SMALL-FLOWERED AGRIMONY	forb	2	FACW		1.0%	0.2%		2.9%	0.5%			
Alisma subcordatum	SOUTHERN WATER-PLANTAIN	forb	2	OBL	3.0%	0.001%	1.1%	3.1%			0.003%	1.0%	1.5%
Ambrosia artemisiifolia	COMMON RAGWEED	forb	0	FACU	5.7%	0.001%	0.003%		0.001%	0.1%	0.002%	0.002%	0.002%
Andropogon gerardii	BIG BLUESTEM	grass	5	FAC		0.4%	6.9%		0.4%	2.5%	0.002%	0.3%	0.1%
Apocynum cannabinum	INDIAN HEMP	forb	1	FAC	1.1%	1.0%	0.7%			1.0%		0.002%	0.002%
Asclepias incarnata	SWAMP MILKWEED	forb	4	OBL	0.2%	1.5%	0.6%		0.001%		0.002%	0.2%	0.003%
Asclepias syriaca	COMMON MILKWEED	forb	1	FACU		0.001%			0.001%			0.1%	
Aster novae-angliae	NEW ENGLAND ASTER	forb	2	FACW-		0.1%						0.002%	
Aster pilosus	AWL ASTER	forb	1	UPL							0.002%		
Baptisia australis	BLUE FALSE INDIGO	forb	6	FACU-									0.2%
Bidens connata	PURPLE-STEMMED BEGGAR'S-TICK	forb	3	FACW+	3.1%	0.1%	0.6%						
Bidens frondosa	DEVIL'S BEGGAR'S-TICK	forb	2	FACW	0.002%		0.1%	0.001%	0.003%		0.002%	0.1%	0.1%
Bouteloua curtipendula	SIDE-OATS GRAMA GRASS	grass	8	UPL								0.1%	
Calystegia sepium	HEDGE BINDWEED	forb	1	FAC							0.002%		
Campsis radicans	TRUMPET-CREEPER	vine	1	FACU							0.002%	0.1%	
Carex comosa	BEARDED SEDGE	sedge	2	OBL				2.0%	0.9%				
Carex cristatella	CRESTED SEDGE	sedge	3	FACW						0.4%			0.002%
Carex frankii	FRANK'S SEDGE	sedge	2	OBL	0.002%					1.7%		0.1%	0.003%
Carex granularis	MEADOW SEDGE	sedge	3	FACW						0.1%		0.1%	0.003%
Carex hystericina	PORCUPINE SEDGE	sedge	5	OBL		1.1%	1.8%	0.001%	1.5%	0.8%			0.002%
Carex lurida	BOTTLEBRUSH SEDGE	sedge	3	OBL					0.4%				
Carex species	SEDGE SPECIES	sedge	NDA	NDA							0.002%		
Carex tribuloides	BLUNT BROOM SEDGE	sedge	4	OBL								0.002%	
Carex vulpinoidea	FOX SEDGE	sedge	1	FACW		0.2%	0.9%		0.3%	1.2%	0.1%	0.5%	0.4%
Cephalanthus occidentalis	BUTTONBUSH	shrub	6	OBL	0.002%				0.001%		0.2%	2.8%	0.6%
Ceratophyllum demersum	COONTAIL	forb	2	OBL	0.6%	9.6%		0.2%	0.001%	1.2%	31.2%	35.6%	25.1%
Cornus racemosa	GRAY DOGWOOD	shrub	1	FAC			0.001%					0.4%	
Cornus species	DOGWOOD SPECIES	small tree	NDA	NDA							0.002%	0.002%	
Cyperus esculentus	YELLOW NUT-SEDGE	sedge	0	FACW			0.001%						
Cyperus species	UMBRELLA SEDGE SPECIES	sedge	NDA	NDA				0.5%	0.7%	1.4%	0.002%		0.003%
Cyperus strigosus	STRAW-COLORED UMBRELLA-SEDGE	sedge	1	FACW		0.001%	0.1%						
Decodon verticillatus	SWAMP LOOSESTRIFE	forb	6	OBL		0.001%							
Desmodium canadense	CANADA TICK-TREFOIL	forb	4	FACU					0.1%	0.002%			
Diodia teres	ROUGH BUTTONWEED	forb	3	FACU			0.001%	0.001%					
Eclipta prostrata	YERBA-DE-TAJO	forb	3	FACW	0.002%								
Eleocharis erythropoda	RED-FOOTED SPIKE-RUSH	sedge	4	OBL	3.4%	18.5%	2.3%	9.7%	2.5%		1.2%	16.0%	13.0%
Eleocharis obtusa	BLUNT SPIKE-RUSH	sedge	1	OBL	6.8%	1.4%	6.0%	0.001%	0.001%		0.1%		
Elymus canadensis	CANADA WILD RYE	grass	6	FACU		0.1%	0.3%		0.003%		0.002%	0.002%	
Epilobium coloratum	PURPLE-LEAVED WILLOW-HERB	forb	1	OBL			0.001%						
Equisetum arvense	FIELD HORSETAIL	fern	0	FAC							0.2%		
Erechtites hieracifolia	PILEWORT	forb	2	FACU		0.001%			0.3%				
Erigeron annuus	DAISY FLEABANE	forb	0	FACU						0.1%			
Eryngium yuccifolium	RATTLESNAKE-MASTER	forb	7	FAC			0.001%						
Eupatorium altissimum	TALL BONESET	forb	0	UPL	0.002%		1.0%		15.8%	0.002%		0.002%	
Eupatorium maculatum	SPOTTED JOE-PYE WEED	forb	6	FACW					13.2%	0.002%			
Eupatorium perfoliatum	COMMON BONESET	forb	3	OBL	0.1%								
Eupatorium serotinum	LATE-FLOWERING BONESET	forb	2	FAC		0.1%	0.001%		1.6%	5.4%	0.002%		
Euthamia graminifolia	FLAT-TOPPED GOLDENROD	forb	2	FACW		0.1%			9.1%	8.7%		0.002%	
Fraxinus pennsylvanica	GREEN ASH	tree	3	FACW			0.001%		0.1%	0.007%	0.002%	3.6%	1.4%
Geum canadense	WHITE AVENS	forb	2	FAC					0.2%				
Gleditsia triacanthos	HONEY LOCUST	tree	4	FACU	1.1%								
Hackelia virginiana	VIRGINIA STICKSEED	forb	2	FACU					0.001%				
Hamamelis virginiana	WITCH-HAZEL	small tree	5	FACU							2.7%		0.002%
Heliopsis helianthoides	SMOOTH OXEYE	forb	5	FACU			0.001%						
Juncus effusus	SOFT RUSH	forb	1	OBL					0.7%	0.4%			
Juncus tenuis	PATH RUSH	forb	1	FAC		0.2%	1.5%		0.003%	1.7%		0.1%	0.002%
Juncus torreyi	TORREY'S RUSH	forb	3	FACW			9.8%		0.8%	2.1%	0.002%		
Juniperus virginiana	EASTERN RED CEDAR	tree	3	FACU						0.002%			
Leersia oryzoides	RICE CUT GRASS	grass	1	OBL	24.5%	24.9%	7.9%	37.5%	0.4%	10.3%	0.7%	0.6%	1.7%
Lemna minor	COMMON DUCKWEED	forb	3	OBL	8.3%	17.2%	14.0%		0.003%	0.005%			0.5%
Liatris spicata	SPIKED BLAZING-STAR	forb	7	FAC						1.9%			
Lobelia siphilitica	GREAT BLUE LOBELIA	forb	3	OBL		0.1%							
Ludwigia palustris	WATER-PURSLANE	forb	3	OBL	0.7%	0.6%	1.0%		0.3%	0.4%	0.6%		
Lycopus americanus	AMERICAN WATER-HOREHOUND	forb	3	OBL	0.002%	0.6%	0.4%					0.004%	
Mentha arvensis	FIELD MINT	forb	2	FACW						0.002%		0.002%	0.002%
Mimulus ringens	COMMON MONKEY-FLOWER	forb	4	OBL					9.8%	4.6%			
Monarda fistulosa	WILD BERGAMOT	forb	3	FACU		0.001%	0.1%		0.1%	0.5%			
Nymphaea odorata	FRAGRANT WATER-LILY	forb	6	OBL						0.002%			
Panicum virgatum	SWITCH GRASS	grass	4	FAC	1.4%	0.1%	7.9%		0.3%	1.0%	0.003%	2.4%	2.3%
Parthenocissus quinquefolia	VIRGINIA CREEPER	vine	2	FACU					0.001%		0.002%		0.002%
Penstemon digitalis	FOXGLOVE BEARD-TONGUE	forb	2	FAC			0.9%						
Penthorum sedoides	DITCH-STONECROP	forb	2	OBL							0.002%	0.3%	
Phyla lanceolata	FOG-FRUIT	forb	3	OBL								1.8%	
Platanus occidentalis	SYCAMORE	tree	7	FACW			0.001%				0.002%	7.1%	0.1%
Polygonum amphibium	WATER SMARTWEED	forb	4	OBL					0.001%				
Polygonum lapathifolium	DOCK-LEAVED SMARTWEED	forb	1	FACW+	0.1%	0.1%							
Polygonum scandens	CLIMBING FALSE BUCKWHEAT	vine	2	FAC					0.001%				
Populus deltoides	EASTERN COTTONWOOD	tree	3	FAC	11.3%		0.003%		0.001%	0.002%	5.9%	0.1%	7.9%
Potamogeton nodosus	LONG-LEAVED PONDWEED	forb	3	OBL	1.9%	3.2%	6.4%	2.5%			35.1%	10.9%	18.0%
Pycnanthemum tenuifolium	NARROW-LEAVED MOUNTAIN-MINT	forb	4	FAC			0.001%						
Ratibida pinnata	GRAY-HEADED CONEFLOWER	forb	5	UPL			0.001%			0.002%			
Rosa palustris	SWAMP ROSE	shrub	5	OBL					1.2%				
Rubus allegheniensis	COMMON BLACKBERRY	shrub	1	FACU					0.004%	0.002%			0.002%
Rudbeckia hirta	BLACK-EYED SUSAN	forb	1	FACU			0.004%					0.002%	0.002%
Salix nigra	BLACK WILLOW	tree	2	OBL	3.8%		0.1%		0.001%	0.8%	0.5%	9.6%	6.6%
Schizachyrium scoparium	LITTLE BLUESTEM	grass	5	FACU			0.1%					0.002%	
Schoenoplectus	SOFT-STEMMED BULRUSH	sedge	2	OBL		2.6%	2.7%	5.4%	0.3%	5.2%	0.002%	0.3%	1.4%
Scirpus atrovirens	GREEN BULRUSH	sedge	1	OBL	0.5%	2.2%	0.2%	0.001%	4.2%	6.9%	0.1%	0.002%	0.1%
Scirpus cyperinus	WOOL-GRASS	sedge	1	OBL		0.2%		0.5%	1.0%				0.6%
Scirpus pendulus	DROOPING BULRUSH	sedge	2	OBL						0.4%	0.002%	0.4%	0.3%
Senna hebecarpa	NORTHERN WILD SENNA	forb	4	FACW	0.002%	0.001%	0.001%						
Solidago canadensis	CANADA GOLDENROD	forb	1	FACU	2.6%	1.5%	2.2%	0.001%	11.9%	2.1%	0.002%	0.2%	0.2%
Sorghastrum nutans	INDIAN GRASS	grass	5	FACU		0.001%	0.2%						0.5%
Sparganium eurycarpum	GIANT BUR-REED	forb	4	OBL	18.8%			3.1%			12.5%	0.1%	
Spartina pectinata	PRAIRIE CORD GRASS	grass	5	FACW				0.2%	10.0%	31.1%			
Toxicodendron radicans	POISON-IVY	vine	1	FAC							0.002%	0.002%	0.1%
Tradescantia ohiensis	OHIO SPIDERWORT	forb	5	FACU			0.001%						0.002%
Ulmus rubra	SLIPPERY ELM	tree	3	FAC					0.001%				
Verbena hastata	BLUE VERVAIN	forb	4	FACW	0.2%	5.0%	0.7%			0.7%			
Verbena urticifolia	WHITE VERVAIN	forb	3	FAC							0.002%	0.002%	
Verbesina alternifolia	WINGSTEM	forb	5	FACW						0.002%			
Vernonia gigantea	TALL IRONWEED	forb	2	FAC	0.002%	0.001%			0.001%	0.1%	0.002%	0.002%	
Vitis vulpina	FROST GRAPE	vine	3	FAC					0.003%	0.002%		0.002%	

Table D-1 (continued). 2015 Wetland Functional Monitoring Area Summary

					Relative Cover (Percent)								
Scientific Name	**Common Name**	**Type**	**CC[a]**	**Wetland Indicator[a,b]**	**FPAW2**	**FPAW4**	**FPAW5**	**FPAW7**	**NPPW4**	**NPPW5**	**WM2W1**	**WM2W2**	**WM2W3**
Cirsium arvense	CANADA THISTLE	forb	0	FACU					0.2%	0.002%	0.002%		
Daucus carota	QUEEN-ANNE'S-LACE	forb	0	UPL			0.001%			0.4%		0.002%	0.003%
Dipsacus fullonum	WILD TEASEL	forb	0	FACU					1.7%	1.8%	0.002%	1.4%	
Dipsacus laciniatus	CUT-LEAVED TEASEL	forb	0	UPL					0.2%	0.8%			0.002%
Echinochloa crusgalli	BARNYARD GRASS	grass	0	FACU			0.4%	0.4%	0.001%				
Epilobium parviflorum	SMALL-FLOWERED WILLOW-HERB	forb	0	FACW					3.9%				
Festuca species	FESCUE SPECIES	grass	0	NDA								0.1%	0.1%
Hydrocotyle ranunculoides	BUTTERCUP-PENNYWORT	forb	0	OBL	0.1%	3.1%	0.001%						
Lonicera maackii	AMUR HONEYSUCKLE	shrub	0	UPL			0.001%						
Lysimachia nummularia	MONEYWORT	forb	0	FACW						0.002%	0.002%	0.6%	1.1%
Melilotus alba	WHITE SWEET-CLOVER	forb	0	FACU-			0.1%					0.1%	
Microstegium vimineum	JAPANESE STILTGRASS	grass	0	FAC					0.2%				
Phalaris arundinacea	REED CANARY GRASS	grass	0	FACW			13.1%						
Plantago major	COMMON PLANTAIN	forb	0	FAC		0.001%							
Poa species	BLUEGRASS SPECIES	grass	0	NDA								0.1%	
Polygonum persicaria	LADY'S THUMB	forb	0	FACW	0.1%		0.1%	0.001%	0.001%	0.002%			
Polygonum species	SMARTWEED SPECIES	forb	0	NDA	0.1%								
Potamogeton crispus	CURLY-LEAVED PONDWEED	forb	0	OBL		0.2%			0.001%	0.7%			
Rumex crispus	CURLY DOCK	forb	0	FAC			0.001%		0.001%	0.1%		0.002%	
Schoenoplectus mucronatus	RICEFIELD BULRUSH	sedge	0	OBL	0.1%			0.2%					
Setaria glauca	YELLOW FOXTAIL GRASS	grass	0	FAC			0.001%						
Solanum carolinense	HORSE NETTLE	forb	0	FACU					0.001%		0.002%	0.005%	
Torilis arvensis	FIELD HEDGE-PARSLEY	forb	0	UPL								0.002%	
Typha angustifolia	NARROW-LEAVED CAT-TAIL	forb	0	OBL					0.2%				
Typha x glauca	HYBRID CAT-TAIL	forb	0	OBL	0.2%	3.2%	7.4%	34.7%			8.8%	1.4%	16.2%
Xanthium strumarium	COMMON COCKLEBUR	forb	0	FAC	0.3%		0.5%		0.8%	0.8%		0.2%	

Highlighted species are non-native

[a]NDA= No determination available; species are not included in the average CC calculation.

[b]OBL = obligate , FAC = facultative , UPL = upland, FACU = facultative-upland, FACW = facultative-wet, + = wetter, - = drier

Table D-2. 2015 Prairie Functional Monitoring Area Summary

Restoration Project Area	Former Production Area							North Pine Plantation	Wetland Mitigation Phase II
Monitoring Sub Area	**FPAA3A**	**FPAA3B**	**FPAA6A**	**FPAA6B**	**FPAMDC**	**NDAARA**	**NDASP7**	**NPPBR1**	**WM2PR1**
Total Species	27	14	26	27	23	41	40	19	46
Native Species	21	10	18	18	18	23	24	10	34
Non-Native Species	6	4	8	9	5	18	16	9	12
Native Species (Percent)	78%	71%	69%	67%	78%	56%	60%	53%	74%
Relative Frequency of Native Species (Percent)	90%	87%	84%	76%	84%	53%	61%	80%	73%
Average Coefficient of Conservatism, range between 0-10	3.0	1.9	2.2	2.1	2.5	1.5	1.2	1.4	1.9
Floristic Quality Assessment Index	15.4	7.0	11.0	11.0	11.9	9.4	7.4	6.0	12.7
Average Total Cover (Percent)	97%	96%	97%	95%	96%	91%	97%	97%	95%

				Relative Frequency (percent)								
Scientific Name	**Common Name**	**Type**	**CC**	**FPAA3A**	**FPAA3B**	**FPAA6A**	**FPAA6B**	**FPAMDC**	**NDAARA**	**NDASP7**	**NPPBR1**	**WM2PR1**
Acer negundo	BOX ELDER	tree	3									1%
Acer saccharum	SUGAR MAPLE	tree	5									1%
Achillea millefolium	YARROW	forb	1									1%
Agrimonia parviflora	SMALL-FLOWERED AGRIMONY	forb	2							1%		
Ambrosia artemisiifolia	COMMON RAGWEED	forb	0		2%	10%	3%	9%	4%	5%		1%
Andropogon gerardii	BIG BLUESTEM	grass	5	15%	13%	13%	11%	14%	5%		14%	10%
Apocynum cannabinum	INDIAN HEMP	forb	1	1%		1%	4%	2%	2%		2%	3%
Asclepias incarnata	SWAMP MILKWEED	forb	4				1%			1%		2%
Asclepias syriaca	COMMON MILKWEED	forb	1	1%					1%	1%		1%
Asclepias tuberosa	BUTTERFLY-WEED	forb	4			2%			1%			
Aster novae-angliae	NEW ENGLAND ASTER	forb	2							1%		1%
Aster pilosus	AWL ASTER	forb	1			2%		1%	2%	9%		1%
Bidens connata	PURPLE-STEMMED BEGGAR'S-TICK	forb	3				1%					
Bidens frondosa	DEVIL'S BEGGAR'S-TICK	forb	2							2%		
Calystegia sepium	HEDGE BINDWEED	forb	1								2%	
Carex blanda	COMMON WOOD SEDGE	sedge	1							2%		
Carex cristatella	CRESTED SEDGE	sedge	3									1%
Carex frankii	FRANK'S SEDGE	sedge	2					1%				1%
Carex hystericina	PORCUPINE SEDGE	sedge	5						1%			1%
Carex tribuloides	BLUNT BROOM SEDGE	sedge	4								2%	
Carex vulpinoidea	FOX SEDGE	sedge	1							1%		2%
Cerastium arvense	FIELD CHICKWEED	forb	2	1%								
Chamaecrista fasciculata	PARTRIDGE-PEA	forb	3							1%		
Cyperus species	UMBRELLA SEDGE SPECIES	sedge	0				1%					
Echinacea purpurea	PURPLE CONEFLOWER	forb	6		2%	1%			1%			
Elymus canadensis	CANADA WILD RYE	grass	6	1%		2%	1%	4%	6%	7%		
Elymus virginicus	VIRGINIA WILD RYE	grass	3							1%		
Erigeron annuus	DAISY FLEABANE	forb	0		2%		1%	1%	2%	2%		
Erigeron strigosus	ROUGH FLEABANE	forb	1						1%	2%		
Eupatorium altissimum	TALL BONESET	forb	0		2%	2%		2%	1%	1%		2%
Eupatorium maculatum	SPOTTED JOE-PYE WEED	forb	6	1%								
Eupatorium serotinum	LATE-FLOWERING BONESET	forb	2		4%		1%		1%	1%		
Euthamia graminifolia	FLAT-TOPPED GOLDENROD	forb	2									1%
Fraxinus pennsylvanica	GREEN ASH	tree	3							3%		4%
Geranium carolinianum	CAROLINA CRANE'S-BILL	forb	3			1%						
Geum canadense	WHITE AVENS	forb	2									1%
Hamamelis virginiana	WITCH-HAZEL	small tree	5									1%
Heliopsis helianthoides	SMOOTH OXEYE	forb	5	3%		2%	1%	2%				
Juncus tenuis	PATH RUSH	forb	1						2%	4%		3%
Leersia oryzoides	RICE CUT GRASS	grass	1							2%		
Liatris spicata	SPIKED BLAZING-STAR	forb	7									1%
Ludwigia palustris	WATER-PURSLANE	forb	3							1%		
Monarda fistulosa	WILD BERGAMOT	forb	3	7%	9%	12%	11%	9%	1%			2%
Panicum capillare	WITCH GRASS	grass	1	1%					1%	1%		
Panicum clandestinum	DEER'S-TONGUE PANIC GRASS	grass	2									1%
Panicum virgatum	SWITCH GRASS	grass	4	18%	21%	8%	11%	9%	6%		18%	7%
Phyla lanceolata	FOG-FRUIT	forb	3							1%		
Ratibida pinnata	GRAY-HEADED CONEFLOWER	forb	5	1%		4%	1%	4%	1%	2%		
Rubus allegheniensis	COMMON BLACKBERRY	shrub	1								2%	
Rubus occidentalis	BLACK RASPBERRY	shrub	1								4%	
Rudbeckia hirta	BLACK-EYED SUSAN	forb	1	3%		2%	4%	2%	3%			1%
Salix nigra	BLACK WILLOW	tree	2			1%						1%
Schizachyrium scoparium	LITTLE BLUESTEM	grass	5	3%			3%	2%	1%			
Scirpus atrovirens	GREEN BULRUSH	sedge	1									2%
Scirpus pendulus	DROOPING BULRUSH	sedge	2						1%			1%
Senna hebecarpa	NORTHERN WILD SENNA	forb	4	1%		2%						
Silphium perfoliatum	CUP-PLANT	forb	6									1%
Solidago canadensis	CANADA GOLDENROD	forb	1	15%	28%	14%	17%	14%	10%	10%	27%	13%
Solidago juncea	PLUME GOLDENROD	forb	2									1%
Solidago rigida	STIFF GOLDENROD	forb	8	1%				4%				
Sorghastrum nutans	INDIAN GRASS	grass	5	3%			1%	1%	1%		4%	1%
Toxicodendron radicans	POISON-IVY	vine	1									1%
Tradescantia ohiensis	OHIO SPIDERWORT	forb	5	4%	4%	1%	1%	1%				
Verbena hastata	BLUE VERVAIN	forb	4	4%								
Verbena urticifolia	WHITE VERVAIN	forb	3	1%								
Vernonia gigantea	TALL IRONWEED	forb	2	1%								1%
Vitis vulpina	FROST GRAPE	vine	3								4%	
Agrostis gigantea	REDTOP	grass	0							2%	2%	
Allium vineale	FIELD GARLIC	forb	0							1%	2%	1%
Barbarea vulgaris	YELLOW ROCKET	forb	0								2%	
Bromus japonicus	JAPANESE BROME	grass	0						2%	6%	2%	1%
Cirsium arvense	CANADA THISTLE	forb	0	1%			1%				2%	1%
Convolvulus arvensis	FIELD BINDWEED	forb	0		2%							
Coronilla varia	CROWN-VETCH	forb	0								2%	
Daucus carota	QUEEN-ANNE'S-LACE	forb	0	1%		2%		1%	4%	2%		2%
Dipsacus fullonum	WILD TEASEL	forb	0		4%	1%	8%	1%	2%	3%		7%
Dipsacus laciniatus	CUT-LEAVED TEASEL	forb	0				1%					
Echinochloa crusgalli	BARNYARD GRASS	grass	0		2%					1%		
Festuca elatior	TALL FESCUE	grass	0						2%	1%		1%
Festuca species	FESCUE SPECIES	grass	0						1%			
Lonicera japonica	JAPANESE HONEYSUCKLE	vine	0									1%
Lonicera maackii	AMUR HONEYSUCKLE	shrub	0			1%						1%
Lotus corniculatus	BIRD'S-FOOT TREFOIL	forb	0							2%		
Lysimachia nummularia	MONEYWORT	forb	0									3%
Medicago lupulina	BLACK MEDICK	forb	0	3%		2%	3%	3%	4%			
Melilotus alba	WHITE SWEET-CLOVER	forb	0	1%					1%			

Table D-2 (continued). 2015 Prairie Functional Monitoring Area Summary

				Relative Frequency (percent)								
Scientific Name	**Common Name**	**Type**	**CC**	**FPAA3A**	**FPAA3B**	**FPAA6A**	**FPAA6B**	**FPAMDC**	**NDAARA**	**NDASP7**	**NPPBR1**	**WM2PR1**
Agrostis gigantea	REDTOP	grass	0							2%	2%	
Allium vineale	FIELD GARLIC	forb	0							1%	2%	1%
Barbarea vulgaris	YELLOW ROCKET	forb	0								2%	
Bromus japonicus	JAPANESE BROME	grass	0						2%	6%	2%	1%
Cirsium arvense	CANADA THISTLE	forb	0	1%			1%				2%	1%
Convolvulus arvensis	FIELD BINDWEED	forb	0		2%							
Coronilla varia	CROWN-VETCH	forb	0								2%	
Daucus carota	QUEEN-ANNE'S-LACE	forb	0	1%		2%		1%	4%	2%		2%
Dipsacus fullonum	WILD TEASEL	forb	0		4%	1%	8%	1%	2%	3%		7%
Dipsacus laciniatus	CUT-LEAVED TEASEL	forb	0				1%					
Echinochloa crusgalli	BARNYARD GRASS	grass	0		2%					1%		
Festuca elatior	TALL FESCUE	grass	0						2%	1%		1%
Festuca species	FESCUE SPECIES	grass	0						1%			
Lonicera japonica	JAPANESE HONEYSUCKLE	vine	0									1%
Lonicera maackii	AMUR HONEYSUCKLE	shrub	0			1%						1%
Lotus corniculatus	BIRD'S-FOOT TREFOIL	forb	0							2%		
Lysimachia nummularia	MONEYWORT	forb	0									3%
Medicago lupulina	BLACK MEDICK	forb	0	3%		2%	3%	3%	4%			
Melilotus alba	WHITE SWEET-CLOVER	forb	0	1%					1%			
Melilotus officinalis	YELLOW SWEET-CLOVER	forb	0			5%	1%	9%	7%	9%		4%
Phleum pratense	TIMOTHY	grass	0						1%			
Plantago lanceolata	ENGLISH PLANTAIN	forb	0			1%			3%	3%		1%
Plantago major	COMMON PLANTAIN	forb	0						1%			
Poa species	BLUEGRASS SPECIES	grass	0						3%	2%		4%
Polygonum persicaria	LADY'S THUMB	forb	0		6%	1%	1%					
Polygonum species	SMARTWEED SPECIES	forb	0	1%								
Pyrus calleryana	CALLERY PEAR	small tree	0						1%			
Triticum aestivum	REGREEN	grass	0					2%	3%	2%		
Saponaria officinalis	SOAPWORT	forb	0								2%	
Setaria species	FOXTAIL SPECIES	grass	0				4%		1%		4%	
Solanum carolinense	HORSE NETTLE	forb	0			1%					2%	
Torilis arvensis	FIELD HEDGE-PARSLEY	forb	0	1%			3%					
Trifolium hybridum	ALSIKE CLOVER	forb	0						3%	1%		
Trifolium pratense	RED CLOVER	forb	0				1%		8%	1%		
Trifolium repens	WHITE CLOVER	forb	0						2%			
Typha gluaca	HYBRID CAT-TAIL	forb	0							2%		
Xanthium strumarium	COMMON COCKLEBUR	forb	0							1%		

Highlighted species are non-native

[a]NDA= No determination available; these species are not included in the average CC calculation.

Table D-3. 2015 Forest Herbaceous Functional Monitoring Area Summary

Restoration Project Area	North Pine Plantation			Northern Woodlot Enhancement			
Monitoring Sub Area	**NPPPP1**	**NPPRF1**	**NPPSF1**	**NWEFO1**	**NWERF1**	**NWESF1**	**NWESF2**
Total Species	46	43	30	46	63	54	45
Native Species	34	30	20	33	43	43	34
Non-Native Species	12	13	10	13	20	11	11
Native Species (Percent)	74%	70%	67%	72%	68%	80%	76%
Relative Frequency of Native Species (Percent)	75%	71%	56%	72%	66%	76%	72%
Average Coefficient of Conservatism, range between 0-10	1.7	1.9	1.6	2.3	1.4	2.0	1.4
Floristic Quality Assessment Index	11.4	12.5	8.6	15.6	11.1	14.6	9.5
Average Total Cover (Percent)	66%	88%	43%	63%	92%	85%	91%

				Relative Frequency						
Scientific Name (Assumed Species)	**Common Name**	**Type**	**CC**	**NPPPP1**	**NPPRF1**	**NPPSF1**	**NWEFO1**	**NWERF1**	**NWESF1**	**NWESF2**
Acalypha rhomboidea	RHOMBIC THREE-SEEDED MERCURY	forb	0				1%	1%	1%	1%
Acer negundo	BOX ELDER	tree	3	2%			2%	1%		
Acer saccharum	SUGAR MAPLE	tree	5				3%		1%	
Acer species (Acer rubra or Acer saccharum)	MAPLE SPECIES	tree	2					1%	1%	
Achillea millefolium	YARROW	forb	1						1%	1%
Aesculus glabra	OHIO BUCKEYE	tree	6	1%			1%			
Agrimonia parviflora	SMALL-FLOWERED AGRIMONY	forb	2	1%	2%		2%	2%	1%	6%
Agrimonia rostellata	WOODLAND AGRIMONY	forb	5			3%				
Allium canadense	WILD GARLIC	forb	2					1%		
Ambrosia artemisiifolia	COMMON RAGWEED	forb	0	1%	1%	2%				
Andropogon gerardii	BIG BLUESTEM	grass	5		4%			1%		
Apocynum cannabinum	INDIAN HEMP	forb	1					1%		1%
Asarum canadense	WILD GINGER	forb	6				2%			
Asclepias syriaca	COMMON MILKWEED	forb	1						1%	
Aster novae-angliae	NEW ENGLAND ASTER	forb	2							1%
Aster pilosus	AWL ASTER	forb	1	2%	2%	2%	1%	3%	2%	2%
Baptisia australis	BLUE FALSE INDIGO	forb	6		2%					
Bidens connata	PURPLE-STEMMED BEGGAR'S-TICK	forb	3			2%				
Bidens frondosa	DEVIL'S BEGGAR'S-TICK	forb	2	1%		3%	1%		1%	
Boehmeria cylindrica	FALSE NETTLE	forb	4	2%	1%			1%	3%	
Calystegia sepium	HEDGE BINDWEED	forb	1	1%	1%					
Campsis radicans	TRUMPET-CREEPER	vine	1	3%					1%	1%
Cardamine concatenata	CUT-LEAVED TOOTHWORT	forb	3				2%			
Carex amphibola	EASTERN NARROW-LEAVED SEDGE	sedge	5		3%		1%		1%	
Carex blanda	COMMON WOOD SEDGE	sedge	1					1%		
Carex cristatella	CRESTED SEDGE	sedge	3					1%		1%
Carex davisii	DAVIS' SEDGE	sedge	5						1%	
Carex granularis	MEADOW SEDGE	sedge	3					1%		1%
Carex jamesii	JAMES' SEDGE	sedge	6		1%					
Carex species	SEDGE SPECIES	sedge	NDA[a]	1%		2%		1%	1%	2%
Carex stricta	TUSSOCK SEDGE	sedge	5						1%	2%
Carex vulpinoidea	FOX SEDGE	sedge	1					1%		
Carya cordiformis	BITTERNUT HICKORY	tree	5						1%	
Cimicifuga racemosa	BLACK SNAKEROOT	forb	7	1%						
Claytonia virginica	SPRING-BEAUTY	forb	2				3%	1%		
Cornus amomum	SILKY DOGWOOD	shrub	2							2%
Cornus racemosa	GRAY DOGWOOD	shrub	1					1%		
Cryptotaenia canadensis	HONEWORT	forb	3					1%		
Desmodium canadense	CANADA TICK-TREFOIL	forb	4					1%		1%
Echinocystis lobata	WILD CUCUMBER	vine	2		1%					
Elymus canadensis	CANADA WILD RYE	grass	6	2%		2%	3%	1%	3%	
Elymus hystrix	BOTTLEBRUSH GRASS	grass	4	1%						
Erigeron annuus	DAISY FLEABANE	forb	0					1%		
Eupatorium rugosum	WHITE SNAKEROOT	forb	3	4%			3%	1%	1%	
Eupatorium species (Eupatorium altissimum or Eupatorium serotinum)	SNAKEROOT SPECIES	forb	0					1%		
Euthamia graminifolia	FLAT-TOPPED GOLDENROD	forb	2		1%			1%		2%
Fragaria vesca var. americana	AMERICAN WOODLAND STRAWBERRY	forb	3	1%						
Fraxinus pennsylvanica	GREEN ASH	tree	3	3%	3%	2%	4%	2%	5%	4%
Galium aparine	CLEAVERS	forb	0	1%		2%		2%		2%
Galium species (Galium aparine)	BEDSTRAW SPECIES	forb	0						1%	
Geum canadense	WHITE AVENS	forb	2	2%	4%	2%	3%	2%	6%	2%
Geum laciniatum	ROUGH AVENS	forb	2				3%			
Geum species (Geum laciniatum or Geum canadense)	AVENS SPECIES	forb	2					4%		2%
Geum vernum	SPRING AVENS	forb	2						1%	1%
Glyceria striata	FOWL MANNA GRASS	grass	2				1%			
Hackelia virginiana	VIRGINIA STICKSEED	forb	2			2%				
Heliopsis helianthoides	SMOOTH OXEYE	forb	5			2%		1%		1%
Impatiens capensis	SPOTTED TOUCH-ME-NOT	forb	2	3%		7%	6%	2%	7%	2%
Juncus tenuis	PATH RUSH	forb	1							2%
Juniperus virginiana	EASTERN RED CEDAR	tree	3						1%	
Mentha arvensis	FIELD MINT	forb	2	1%						
Monarda fistulosa	WILD BERGAMOT	forb	3		3%					1%
Oxalis stricta	COMMON YELLOW WOOD-SORREL	forb	0	3%	3%			2%	4%	2%
Panicum clandestinum	DEER'S-TONGUE PANIC GRASS	grass	2					5%	1%	4%
Panicum virgatum	SWITCH GRASS	grass	4		3%					
Parthenocissus quinquefolia	VIRGINIA CREEPER	vine	2	5%		5%	9%	3%	5%	2%
Phacelia purshii	MIAMI-MIST	forb	4						1%	
Phytolacca americana	POKEWEED	forb	1	1%						
Pilea pumila	CLEARWEED	forb	2	1%			3%		1%	
Podophyllum peltatum	MAYAPPLE	forb	4				2%			
Polygonum scandens	CLIMBING FALSE BUCKWHEAT	vine	2	1%						
Polygonum species	KNOTWEED SPECIES	forb	NDA[a]	3%			1%	1%	3%	
Populus deltoides	EASTERN COTTONWOOD	tree	3		3%					
Prunella vulgaris	SELF-HEAL	forb	0						1%	
Quercus rubra	RED OAK	tree	6				1%			
Ranunculus recurvatus	HOOKED CROWFOOT	forb	3					1%		
Rubus allegheniensis	COMMON BLACKBERRY	shrub	1	3%	5%			1%	1%	2%
Rubus occidentalis	BLACK RASPBERRY	shrub	1	6%	1%			1%	1%	2%
Rubus species (Rubus allegheniensis or Rubus occidentalis)	WILD BERRY SPECIES	shrub	1		4%	2%				
Salix nigra	BLACK WILLOW	tree	2		1%					
Senecio obovatus	ROUND-LEAVED SQUAW-WEED	forb	4				1%			
Silphium perfoliatum	CUP-PLANT	forb	6		1%					
Smilax hispida	BRISTLY GREENBRIER	vine	3						1%	
Solidago canadensis	CANADA GOLDENROD	forb	1	2%	13%	3%	1%	7%	5%	10%
Solidago rugosa	ROUGH GOLDENROD	forb	2						1%	
Sorghastrum nutans	INDIAN GRASS	grass	5		1%					
Strophostyles helvula	WILD BEAN	forb	3			3%				
Toxicodendron radicans	POISON-IVY	vine	1	3%	3%		3%	7%	5%	4%
Trillium sessile	TOAD-SHADE	forb	5				2%			

Table D-3 (continued). 2015 Forest Herbaceous Functional Monitoring Area Summary

				Relative Frequency						
Scientific Name (Assumed Species)	**Common Name**	**Type**	**CC**	**NPPPP1**	**NPPRF1**	**NPPSF1**	**NWEFO1**	**NWERF1**	**NWESF1**	**NWESF2**
Ulmus americana	AMERICAN ELM	tree	2		2%					
Ulmus rubra	SLIPPERY ELM	tree	3		2%				1%	
Ulmus species (Ulmus americana or Ulmus rubra)	ELM SPECIES	tree	2			3%	1%	1%	1%	
Urtica dioica	AMERICAN STINGING NETTLE	forb	1	2%	3%	5%	2%	1%	1%	2%
Verbesina alternifolia	WINGSTEM	forb	5	1%			3%			
Vernonia gigantea	TALL IRONWEED	forb	2		2%					2%
Viburnum prunifolium	BLACK-HAW	shrub	4						1%	
Viola sororia	COMMON BLUE VIOLET	forb	1					1%		
Viola species	VIOLET SPECIES	forb	NDA[a]	3%			4%			1%
Vitis labrusca	FOX GRAPE	vine	3	1%			1%	1%		
Vitis riparia	RIVERBANK GRAPE	vine	3						1%	
Vitis species (Vitis labrusca or Vitis vulpina)	GRAPE SPECIES	vine	3	3%	1%	5%	2%	1%	1%	1%
Zizia aurea	GOLDEN ALEXANDERS	forb	6						1%	
Alliaria petiolata	GARLIC MUSTARD	forb	0	4%	1%	8%	7%	1%	1%	
Allium species (Allium vineale)	GARLIC SPECIES	forb	0		1%				1%	2%
Allium vineale	FIELD GARLIC	forb	0				1%	1%		
Barbarea vulgaris	YELLOW ROCKET	forb	0							1%
Bromus inermis	HUNGARIAN BROME	grass	0	1%						
Carum carvi	CARAWAY	forb	0				1%			
Cirsium arvense	CANADA THISTLE	forb	0	1%						
Convolvulus arvensis	FIELD BINDWEED	forb	0			2%				
Dactylis glomerata	ORCHARD GRASS	grass	0			2%		2%		1%
Daucus carota	QUEEN-ANNE'S-LACE	forb	0		2%			1%		
Dipsacus fullonum	WILD TEASEL	forb	0		4%			1%		1%
Dipsacus laciniatus	CUT-LEAVED TEASEL	forb	0		1%					
Euonymous fortunei	WINTERCREEPER	vine	0				1%			
Festuca species	FESCUE SPECIES	grass	0	1%				1%		
Glechoma hederacea	GROUND IVY	forb	0	4%	4%			1%	1%	3%
Lamium purpuream	PURPLE DEAD-NETTLE	forb	0	1%						
Lithospermum officinale	EUROPEAN GROMWELL	forb	0				2%			
Lonicera japonica	JAPANESE HONEYSUCKLE	vine	0		1%	2%	1%	1%	2%	4%
Lonicera maackii	AMUR HONEYSUCKLE	shrub	0	5%	4%	20%	7%	5%	5%	4%
Lysimachia nummularia	MONEYWORT	forb	0				3%	7%	6%	6%
Melilotus alba	WHITE SWEET-CLOVER	forb	0					1%		
Melilotus officinalis	YELLOW SWEET-CLOVER	forb	0					1%		
Microstegium vimineum	JAPANESE STILTGRASS	grass	0	1%		5%	2%	1%	1%	
Poa species	BLUEGRASS SPECIES	grass	0		4%			5%	1%	5%
Polygonum persicaria	LADY'S THUMB	forb	0	1%		2%		1%		
Triticum aestivum	REGREEN	grass	0						1%	
Rosa multiflora	MULTIFLORA ROSE	shrub	0	1%		2%	1%	3%	3%	1%
Rumex crispus	CURLY DOCK	forb	0					1%		
Solanum carolinense	HORSE NETTLE	forb	0					1%		
Stellaria media	COMMON CHICKWEED	forb	0	1%						
Taraxacum officinale	COMMON DANDELION	forb	0		1%	2%				
Torilis arvensis	FIELD HEDGE-PARSLEY	forb	0	2%						1%
Trifolium pratense	RED CLOVER	forb	0					1%		
Trifolium species (Trifolium pratense or Trifolium repens)	CLOVER SPECIES	forb	0		1%					
Unknown	UNKNOWN	forb	NDA[a]		3%	2%	2%			
Unknown	UNKNOWN	grass	NDA[a]		5%		2%		2%	
Unknown	UNKNOWN	sedge	NDA[a]					1%		
Unknown	UNKNOWN	woody	NDA[a]				1%			

Highlighted species are non-native

[a]NDA= No determination available; these species are not included in the average CC calculation.

Table D-4. 2015 Forest Woody Functional Monitoring Area Summary

Restoration Project Area	North Pine Plantation			North Woodlot Enhancement		
Monitoring Sub Area	**NPPPP1**	**NPPRF1**	**NPPSF1**	**NWEFO1**	**NWERF1**	**NWESF1**
Total Species	17	30	13	11	21	17
Native Species	10	27	11	10	16	15
Non-Native Species	7	3	2	1	5	2
Native Species (Percent)	59%	90%	85%	91%	76%	88%
Relative Density of Native Species (Percent)	46%	97%	30%	96%	84%	48%
Average Coefficient of Conservatism, range between 0-10	1.9	4.0	3.5	4.8	3.0	3.8
Floristic Quality Assessment Index	7.8	21.7	12.5	16.0	14.0	15.8
Average Diameter at Breast Height (cm)	10.6	5.7	15.7	28.0	5.3	13.4
Total Abundance	214	419	309	68	535	234

				NPPPP1		NPPRF1		NPPSF1		NWEFO1		NWERF1		NWESF1	
Scientific Name	**Common Name**	**Type**	**CC**	**Average DBH (cm)**	**Relative Density (Percent)**	**Average DBH (cm)**	**Relative Density (Percent)**	**Average DBH (cm)**	**Relative Density (Percent)**	**Average DBH (cm)**	**Relative Density (Percent)**	**Average DBH (cm)**	**Relative Density (Percent)**	**Average DBH (cm)**	**Relative Density (Percent)**
Acer negundo	BOX ELDER	tree	3	2.02	10.7%	4.96	1.4%			13.7	8.8%	9	0.4%	21.25	3.4%
Acer rubrum	RED MAPLE	tree	2			2.75	0.5%								
Acer saccharinum	SILVER MAPLE	tree	3			6.13	1.4%								
Acer saccharum	SUGAR MAPLE	tree	5			4.69	3.8%			14.88	55.9%			12.5	0.4%
Aesculus glabra	OHIO BUCKEYE	tree	6							5.79	10.3%				
Asimina triloba	PAWPAW	small tree	6			1.9	1.2%								
Carya cordiformis	BITTERNUT HICKORY	tree	5			0.5	0.2%			22.5	1.5%			3.75	0.4%
Carya glabra	PIGNUT HICKORY	tree	5			0.5	0.2%								
Carya laciniosa	SHELLBARK HICKORY	tree	7									1.75	0.2%	15.11	19.7%
Carya tomentosa	MOCKERNUT HICKORY	tree	6			1.75	0.2%								
Celtis occidentalis	HACKBERRY	tree	4	7.5	0.5%	3.75	0.2%	13.93	4.5%	34	4.4%	22.5	0.2%	12.5	1.7%
Cephalanthus occidentalis	BUTTONBUSH	shrub	6									5.2	0.7%		
Cercis canadensis	REDBUD	small tree	3			7.5	0.2%	17.5	0.3%						
Cornus florida	FLOWERING DOGWOOD	small tree	5					3.75	1.9%					7.5	1.3%
Cornus racemosa	GRAY DOGWOOD	shrub	1			2.44	1.0%					1.58	24.7%		
Cornus species	DOGWOOD SPECIES	small tree	1			3.75	0.2%								
Crataegus crus-galli	COCKSPUR	small tree	3			0.5	0.2%								
Fagus grandifolia	AMERICAN BEECH	tree	7			5.25	1.2%					2.13	1.3%		
Fraxinus americana	WHITE ASH	tree	6	12.5	0.5%	3.69	1.0%								
Fraxinus pennsylvanica	GREEN ASH	tree	3	1.2	4.7%	2.65	4.8%	19.82	2.3%	26.25	5.9%	3.68	38.9%	11.5	0.9%
Fraxinus quadrangulata	BLUE ASH	tree	7							22.1	1.5%				
Gleditsia triacanthos	HONEY LOCUST	tree	4									7.5	0.6%		
Juglans nigra	BLACK WALNUT	tree	5	3.75	0.5%	7.98	2.4%	21.59	4.2%			1.13	0.4%	27.5	0.4%
Juniperus virginiana	EASTERN RED CEDAR	tree	3									5.55	5.4%		
Morus rubra	RED MULBERRY	tree	7			2.42	0.5%								
Ostrya virginiana	HOP-HORNBEAM	tree	5			7.5	0.2%					1.75	0.4%		
Platanus occidentalis	SYCAMORE	tree	7									12.92	0.6%		
Populus deltoides	EASTERN COTTONWOOD	tree	3			7.62	12.6%								
Prunus americana	AMERICAN PLUM	small tree	3									1.75	0.2%		
Prunus serotina	BLACK CHERRY	tree	3	20	0.9%			17.5	0.3%			12.5	0.2%	17.5	0.4%
Quercus alba	WHITE OAK	tree	6			6.56	1.0%								
Quercus coccinea	SCARLET OAK	tree	6											22.5	0.4%
Quercus prinus	ROCK CHESTNUT OAK	tree	7			22.5	0.2%							17.5	0.9%
Quercus rubra	RED OAK	tree	6			17.5	0.2%	32.5	0.3%	58.7	2.9%			32.5	0.4%
Quercus shumardii	SHUMARD OAK	tree	7			22.5	0.7%	20.36	2.3%						
Quercus velutina	BLACK OAK	tree	7			3.75	0.5%	31.83	1.0%	55.65	2.9%				
Robinia pseudoacacia	BLACK LOCUST	tree	0					10.48	11.0%						
Rubus allegheniensis	COMMON BLACKBERRY	shrub	1	0.5	6.5%										
Rubus occidentalis	BLACK RASPBERRY	shrub	1	0.5	18.2%	0.5	50.4%					0.5	9.5%	0.5	15.0%
Sambucus canadensis	COMMON ELDERBERRY	shrub	3	0.92	2.8%										
Ulmus americana	AMERICAN ELM	tree	2			4.14	10.3%	13.3	1.9%			15.8	0.6%	20	0.9%
Ulmus thomasii	ROCK ELM	small tree	7							54.4	1.5%				
Vitis species	GRAPE SPECIES	vine	3											4.19	1.7%
Vitis vulpina	FROST GRAPE	vine	3	15	0.9%										
Ailanthus altissima	TREE-OF-HEAVEN	tree	0	7.5	0.5%										
Elaeagnus umbellata	AUTUMN-OLIVE	small tree	0	3.75	0.5%							1.94	1.5%		
Lonicera japonica	JAPANESE HONEYSUCKLE	vine	0									0.5	0.2%		
Lonicera maackii	AMUR HONEYSUCKLE	shrub	0	1.22	30.8%	2.54	1.4%	1.13	69.6%	0.5	4.4%	1.88	10.8%	1.22	28.6%
Maclura pomifera	OSAGE-ORANGE	tree	0									1.75	0.6%		
Morus alba	WHITE MULBERRY	tree	0	19.58	1.4%	3.7	1.2%								
Pinus nigra	AUSTRIAN PINE	tree	0	53.7	0.5%										
Pinus strobus	WHITE PINE	tree	6	29.55	19.6%										
Pyrus calleryana	CALLERY PEAR	small tree	0			8.13	0.5%								
Rosa multiflora	MULTIFLORA ROSE	shrub	0	0.5	0.5%			0.5	0.3%			0.5	2.8%	1	23.5%

Highlighted species are non-native.

[a]NDA= No determination available; species not included in the average CC calculation.

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Table D-5. Wetland Functional Monitoring Comparison

Parameter[a]	Former Production Area			Baseline	North Pine Plantation			Baseline	Wetland Mitigation, Phase II			Baseline	Reference
	2009	2012	2015	Developed[b]	2009	2012	2015	Developed[b]	2009	2012	2015	Open Water[b]	Emergent Wetland[b]
Total Species	103	114	81	NA	79	87	78	NA	67	95	83	33	61
Native Species	82	88	66	NA	62	81	64	NA	52	76	70	16	55
Native Species (Percent)	80%	77%	81%	NA	78%	82%	82%	NA	78%	80%	84%	48%	90%
Average CC	2.30	2.16	2.31	NA	2.15	2.37	2.25	NA	2.07	2.40	2.25	1.12	3.52
FQAI	23	23	21	NA	19	22	20	NA	17	23	21	6.4	28
Average VIBI	40	26	26	NA	51	50	39	NA	50	51	37	NA	NA
Hydrophytic Species (Percent)	50%	51%	55%	NA	57%	52%	50%	NA	55%	49%	47%	19%	59%

[a] cc = coefficient of conservatism, FQAI = Floristic Quality Assessment Index, VIBI= Vegetation Index of Biotic Integrity.
[b] Not applicable. Developed areas were not characterized; therefore, baseline conditions are assumed to be zero for all parameters.

Table D-6. Prairie Functional Monitoring Comparison

Parameter[a]	Former Production Area			Baseline	North Pine Plantation			Baseline	Wetland Mitigation, Phase II	Baseline	Reference
	2010	2013	2015	Developed[b]	2010	2013	2015	Grazed Pasture	2015	Grazed Pasture	Upland Prairie
Total Species	91	85	81	NA	32	31	19	38	46	38	88
Native Species	56	52	49	NA	15	21	10	15	34	15	81
Native Species (Percent)	62%	61%	60%	NA	47%	68%	53%	39%	74%	39%	92%
Average CC	1.8	1.8	1.7	NA	1.3	1.8	1.4	0.4	1.9	0.4	3.2
FQAI	16.7	17.0	15.4	NA	7.2	10.1	6.0	2.6	12.7	2.60	30.5

[a] cc = coefficient of conservatism, FQAI = Floristic Quality Assessment Index.
[b] Not applicable. Developed areas were not characterized; therefore, baseline conditions are assumed to be zero for all parameters.

Table D-7. Prairie Vegetation Year-by-Year Floristic Quality Assessment Index (FQAI) Comparison

Restoration Project Area	Monitoring Subarea	Year		
		2010	2013	2015
Former Production Area	FPAA3A	12.9	13.1	15.4
	FPAA3B	13.7	7.2	7.0
	FPAA6A	11.3	13.6	11.0
	FPAA6B	13.6	12.1	11.0
	FPAMDC	12.0	9.9	11.9
	NDAARA	9.9	10.4	9.4
	NDASP7	5.5	13.6	7.4
Northern Pine Plantation	NPPBR1	7.2	10.5	6.0
Wetland Mitigation, Phase II	WM2PR1	NA	NA	12.7

Table D-8. Forest Functional Monitoring Comparison

Parameter[a]	Northern Pine Plantation			Baseline	Northern Woodlot Enhancement				Baseline	Reference
	2011	2014	2015	Pine Plantation	2005	2011	2014	2015	Woodlot	Upland Forest Complex
Total Species	104	91	109	36	81	103	115	120	56	62
Native Species	79	66	82	26	57	82	88	93	42	58
Native Species (Percent)	76%	73%	75%	72%	70%	80%	77%	78%	75%	94%
Average CC[a]	2.6	2.1	2.6	1.9	1.8	2.5	2.4	2.4	2.4	3.9
FQAI	26.4	19.6	26.9	11.3	16.1	24.9	25.9	2669	18.0	30.5

[a]CC = coefficient of conservatism, FQAI = Floristic Quality Assessment Index

Table D- 9. Amphibian Monitoring Summary

Restoration Project Area	Wetland Area	Species and Number of Individuals											
		Cricket Frog (*Acris crepitans*)	Streamside Salamander (*Ambystoma barbouri*)	Marbled Salamander (*Ambystoma opacum*)	Salamander Species (*Ambystomid sp*)	Tiger Salamander (*Ambystoma tigrinum*)	American and Fowlers Toad (*Anaxyrus species*)	Gray Treefrog (*Hyla versicolor*)	American Bull Frog (*Lithobates catesbeiana*)	Green Frog (*Lithobates clamitans*)	Northern Leopard Frog (*Lithobates pipiens*)	Frog Species (*Lithobates sp*)	Spring Peeper (*Pseudacris crucifer*)
Borrow Area (BAP)	BAPW2	0	0	0	0	0	0	0	4	0	0	32	0
	BAPW4	0	0	0	0	0	0	0	2	0	0	13	0
	BAPW7	0	0	0	0	0	0	0	0	0	0	5	1
Former Production Area (FPA)	FPAW2	0	0	0	0	0	3	0	2	0	0	13	3
	FPAW7	0	0	0	0	0	0	0	2	1	6	14	3
	FPAW9	2	0	0	0	0	79	0	1	0	5	11	4
	PREW6	0	0	0	0	0	0	9	0	0	8	311	7
North Pine Plantation (NPP)	NPPW4	0	0	0	2	0	1	0	0	0	0	25	0
	NPPW5	0	0	0	0	0	0	0	0	0	1	26	0
Paddys Run Tributary (PRT)	PRTW1	0	2	0	0	0	0	0	0	0	0	0	1
Wetland Mitigation Phase I (WM1)	WM1W1	0	0	0	0	0	0	0	0	0	0	56	1
	WM1W4	0	0	0	0	0	0	0	1	0	0	2	0
	WM1W7	0	3	0	1	0	1	19	0	0	1	49	0
Wetland Mitigation Phase II (WM2)	WM2W1	0	0	0	1	0	0	0	53	0	1	97	3
	WM2W2	0	2	0	0	0	10	0	5	6	3	3	1
	WM2W3	0	1	0	0	0	0	8	5	1	8	19	0

Table D- 10. Amphibian Index of Biotic Integrity

Restoration Project Area	Wetland Area	AIBI Score[a] 2011 Reported	2011 Corrected	2012 Reported	2012 Corrected	2013 Reported	2013 Corrected	2014 Reported	2014 Corrected	2015 Reported
Borrow Area (BAP)	BAPW2	0	0	10	0	10	0	3	3	0
	BAPW4	0	0	10	0	3	3	3	3	0
	BAPW7	13	13	10	0	10	13	0	0	0
Former Production Area (FPA)	FPAW2	13	13	10	0	23	30	0	0	0
	FPAW7	0	10	20	30	24	27	3	7	3
	FPAW9	10	10	20	24	23	30	3	3	3
	PREW6	13	13	13	3	10	0	0	0	0
North Pine Plantation (NPP)	NPPW4	33	23	13	6	13	16	6	6	3
	NPPW5	0	0	16	13	13	24	9	13	0
Paddys Run Tributary (PRT)	PRTW1	NA[b]	NA[b]	NA[b]	NA[b]	3	3	3	3	27
Wetland Mitigation Phase I (WM1)	WM1W1	3	3	10	0	13	0	3	3	0
	WM1W4	3	3	13	3	10	0	0	0	0
	WM1W7	0	0	10	3	3	6	27	20	9
Wetland Mitigation Phase II (WM2)	WM2W1	13	3	20	13	10	0	12	16	3
	WM2W2	6	6	16	10	10	3	6	10	6
	WM2W3	19	12	16	6	14	13	6	10	9

[a]AIBI = Amphibian Index of Biotic Integrity
[b]NA = Not Applicable

Table D-11. Wetland Mitigation Hydrologic Monitoring Results

Restoration Project Area	Basin	Parameter	Performance Standard	2010	2011	2012	2013	2014	2015	Average
Former Production Area	FPAW2	Water in Root Zone (Percent)	>53%	67%	74%	61%	61%	60%	61%	64%
		Mean Depth of Water (cm)	<29.4	32.2	22.9	32.8	37.8	40.0	31.7	32.9
		Flashiness Index	<2	0.04	0.03	0.05	0.04	0.04	0.04	0.04
	FPAW7	Water in Root Zone (Percent)	>53%	65%	67%	50%	73%	ND[a]	62%	63%
		Mean Depth of Water (cm)	<29.4	22.1	20.0	28.0	24.2	ND[a]	19.3	22.7
		Flashiness Index	<2	0.02	0.05	0.06	0.05	ND[a]	0.06	0.05
	FPAW9	Water in Root Zone (Percent)	>53%	30%	80%	61%	36%	52%	76%	56%
		Mean Depth of Water (cm)	<29.4	53.5	24.4	36.3	53.3	35.8	28.6	38.7
		Flashiness Index	<2	0.03	0.02	0.03	0.07	0.05	0.01	0.04
Wetland Mitigation Phase I	WM1W1	Water in Root Zone (Percent)	>53%	33%	48%	41%	62%	67%	64%	53%
		Mean Depth of Water (cm)	<29.4	49.0	39.3	39.6	35.0	27.9	32.6	37.2
		Flashiness Index	<2	0.03	0.04	0.04	0.04	0.04	0.04	0.04
	WM1W3	Water in Root Zone (Percent)	>53%	57%	69%	39%	34%	31%	39%	45%
		Mean Depth of Water (cm)	<29.4	32.2	33.4	53.9	56.7	46.7	47.6	45.1
		Flashiness Index	<2	0.04	0.05	0.05	0.04	0.04	0.04	0.04
	WM1W5	Water in Root Zone (Percent)	>53%	28%	66%	43%	38%	53%	ND[b]	46%
		Mean Depth of Water (cm)	<29.4	49.9	25.7	41.0	44.3	37.7	ND[b]	39.7
		Flashiness Index	<2	0.07	0.08	0.07	0.07	0.05	ND[b]	0.07
	WM1W6	Water in Root Zone (Percent)	>53%	60%	39%	66%	78%	4%	ND[b]	49%
		Mean Depth of Water (cm)	<29.4	31.8	54.2	33.2	29.8	50.2	ND[b]	39.8
		Flashiness Index	<2	0.03	0.04	0.02	0.02	0.03	ND[b]	0.03
	WM1W7	Water in Root Zone (Percent)	>53%	61%	66%	59%	64%	62%	ND[c]	62%
		Mean Depth of Water (cm)	<29.4	37.7	20.0	38.4	30.7	23.2	ND[c]	30.0
		Flashiness Index	<2	0.04	0.05	0.03	0.03	0.04	ND[c]	0.04

Table D-11 (continued). Wetland Mitigation Hydrologic Monitoring Results

Restoration Project Area	Basin	Parameter	Performance Standard	2010	2011	2012	2013	2014	2015	Average
Wetland Mitigation Phase II	**WM2W2**	Water in Root Zone (Percent)	>53%	59%	51%[e]	56%[e]	36%[e]	27%	92%	54%
		Mean Depth of Water (cm)	<29.4	5.9	19.9	9.5	24.9	35.5	3.2	16.5
		Flashiness Index	<2	0.04	0.06	0.05	0.06	0.05	0.05	0.05
Borrow Area	BAPW2	Water in Root Zone (Percent)	>53%	5%	62%	ND[b]	56%	52%	53%	43%
		Mean Depth of Water (cm)	<29.4	65.6	17.2	ND[b]	40.0	43.4	17.8	36.4
		Flashiness Index	<2	0.06	0.05	ND[b]	0.05	0.05	0.06	0.05
Paddys Run Tributary	PRTW1	Water in Root Zone (Percent)	>53%				21%	18%	30%	23%
		Mean Depth of Water (cm)	<29.4				68.9	68.7	58.5	65.4
		Flashiness Index	<2				0.07	0.08	0.06	0.07
	PRTW2	Water in Root Zone (Percent)	>53%				40%	37%	48%	42%
		Mean Depth of Water (cm)	<29.4				52.6	55.0	47.5	51.7
		Flashiness Index	<2				0.06	0.08	0.06	0.07
	PRTW3	Water in Root Zone (Percent)	>53%				39%	ND[c]	46%	ND[d]
		Mean Depth of Water (cm)	<29.4				55.1	ND[c]	44.1	ND[d]
		Flashiness Index	<2				0.05	ND[c]	0.05	ND[d]

Shading indicates the performance standard has been met.

Bold indicates a basin in which DOE proposes to discontinue hydrological monitoring.

[a] ND = not determined, no data collected due to damaged piezometer.
[b] ND = not determined, partial data collected due to transducer failure.
[c] ND = not determined, no data collected due to transducer failure.
[d] ND = not determined.
[e] Indicates corrected value.

Table D-12. Paddys Run Streambank Stabilization Implementation Monitoring Data Summary

Area	Regrade and Fabric Area	Soil Encapsulated Lifts Area
Total Species	26	20
Native Species	14	13
Non-Native Species	12	7
Percent Native	54%	65%
Relative Frequency of Native Species (Percent)	52%	56%
Mean Coefficient of Conservatism	1.0	1.8
Floristic Quality Assessment Index	5.1	8.2
Total Cover (Percent)	67%	56%

				Relative Frequency (percent)	
Scientific Name	**Common Name**	**Type**	**CC**	**Regrade and Fabric Area**	**Soil Encapsulated Lifts Area**
Aster pilosus	AWL ASTER	forb	1	2%	
Bidens frondosa	DEVIL'S BEGGAR'S-TICK	forb	2	2%	
Carex species	SEDGE SPECIES	sedge	NDA[a]	2%	
Cyperus species	UMBRELLA SEDGE SPECIES	sedge	NDA[a]	2%	
Echinacea purpurea	PURPLE CONEFLOWER	forb	6	4%	6%
Ludwigia palustris	WATER-PURSLANE	forb	3	2%	6%
Oxalis stricta	COMMON YELLOW WOOD-SORREL	forb	0	4%	
Panicum capillare	WITCH GRASS	grass	1	6%	8%
Parthenocissus quinquefolia	VIRGINIA CREEPER	vine	2	4%	3%
Platanus occidentalis	SYCAMORE	tree	7		3%
Populus deltoides	EASTERN COTTONWOOD	tree	3	6%	8%
Rudbeckia hirta	BLACK-EYED SUSAN	forb	1	2%	3%
Salix nigra	BLACK WILLOW	tree	2	6%	
Senna hebecarpa	NORTHERN WILD SENNA	forb	4		3%
Solidago canadensis	CANADA GOLDENROD	forb	1		3%
Solidago species	GOLDENROD SPECIES	forb	NDA[a]		3%
Toxicodendron radicans	POISON-IVY	vine	1		3%
Verbena urticifolia	WHITE VERVAIN	forb	3	2%	6%
Vitis species	GRAPEVINE SPECIES	vine	3		3%
Ambrosia artemisiifolia	COMMON RAGWEED	forb	0	8%	
Cirsium arvense	CANADA THISTLE	forb	0	2%	
Convolvulus arvensis	FIELD BINDWEED	forb	0		3%
Daucus carota	QUEEN-ANNE'S-LACE	forb	0	2%	
Echinochloa crusgalli	BARNYARD GRASS	grass	0	6%	11%
Lolium multiflorum	ITALIAN RYEGRASS	grass	0	6%	
Medicago lupulina	BLACK MEDICK	forb	0	8%	3%
Melilotus officinalis	YELLOW SWEET-CLOVER	forb	0	2%	
Microstegium vimineum	RECLINING EULALIA	grass	0		3%
Polygonum persicaria	LADY'S THUMB	forb	0	2%	
Setaria species	FOXTAIL SPECIES	grass	0	8%	14%
Solanum carolinense	HORSE NETTLE	forb	0	4%	
Torilis arvensis	FIELD HEDGE-PARSLEY	forb	0	2%	8%
Trifolium pratense	RED CLOVER	forb	0	4%	
Verbascum thapsus	COMMON MULLEIN	forb	0	2%	3%

Highlighted species are non-native.

[a]NDA= No determination available; species not calculated in average CC.

Table D-13. Central Quadrant Site Inspection Findings, January 2015

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved[a]
1	Patch of debris	Free released and disposed	2/4/2015
2	Concrete	Free released and disposed	2/4/2015
3	Debris patches	Free released and disposed	3/11/2015
4	Debris	Free released and disposed	3/11/2015
5	Concrete	Free released and disposed	3/12/2015
6	Concrete	Free released and disposed	3/12/2015
7	Very large embedded concrete	Free released and disposed	5/6/2015
8	Large erosion rill	Area stable, no action required	9/22/2015
9	Large concrete block	Free released and disposed	2/4/2015
10	Asphalt, fabric matting	Free released and disposed	2/4/2015
11	Asphalt, fabric matting	Free released and disposed	2/4/2015
12	Large chunks of asphalt	Free released and disposed	8/27/2015
13	Small concrete	Free released and disposed	3/11/2015
14	Small concrete/random rubble throughout area	Contaminated, dispositioned accordingly	3/11/2015
15	Asphalt, small concrete area	Free released and disposed	5/6/2015
16	Clay tile (brown glazed) and random asphalt and rubble	Free released and disposed	3/11/2015
17	Erosion potentially due to muskrat	No action required	9/25/2015
18	Erosion (gully) and tree cages knocked down	Erosion repaired	7/30/2015
19	Concrete	Free released and disposed	2/4/2015
20	Concrete	Free released and disposed	2/4/2015
21	Geotextile	Free released and disposed	2/4/2015
22	Concrete	Free released and disposed	2/4/2015
23	Animal burrow	No action required	9/22/2015
24	2 fiberglass stakes	Unable to locate	10/29/2015
25	Glazed tile	To be addressed	NA
26	Debris	Unable to locate	7/30/2015
27	Erosion	To be addressed	NA
28	Debris	Free released and disposed	3/12/2015
29	Debris	Contaminated, dispositioned accordingly	3/12/2015
30	Debris	Free released and disposed	7/30/2015
31	Erosion, hole	To be addressed	NA
32	Cable buried in ground	Free released and disposed	2/4/2015
33	Partial brick	Free released and disposed	2/4/2015
34	Exposed concrete (8 inch × 5 inch)	Free released and disposed	2/4/2015
35	Green and black plastic	Free released and disposed	2/4/2015
36	Consolidated debris	Free released and disposed	3/12/2015
37	2–3-inch concrete debris	Free released and disposed	3/12/2015
38	2–6-inch concrete debris	Free released and disposed	7/30/2015

Table D-14. South Quadrant Site Inspection Findings, February 2015

Map Number	Inspection Finding	Finding Resolution or Path Forward	Date Resolved
1	Concrete	Free released and disposed	7/30/2015
2	Glazed tile	To be addressed	NA
3	Erosion	To be addressed	NA
4	Brick	Contaminated, dispositioned accordingly	3/19/2015
5	Drum lid	Free released and disposed	3/19/2015
6	Hole in deer fence	Fence removed	7/30/2015
7	Hole in deer fence	Fence removed	7/30/2015
8	Erosion	Erosion repaired	7/30/2015
9	Felt	To be addressed	NA
10	Phragmites	To be addressed	NA
11	Old cages	Old cages removed	8/5/2015
12	Young honeysuckle growing	Herbicide applied	11/2/2015
13	Old cages	To be addressed	NA
14	Beer can	Trash removed	8/5/2015
15	Concrete	Riprap, no action required	9/25/2015
16	Fence hanging, ties broken	To be addressed	NA
17	Metal and brick	Free released and disposed	3/19/2015
18	Cages next to creek	To be addressed	NA
19	Metal stakes with fencing	Unable to locate	9/25/2015
20	Concrete × 3	Free released and disposed	10/29/2015
21	Brown glazed tile (plus terra cotta)	Contaminated, dispositioned accordingly	3/19/2015
22	Previously flagged brown gloop	Organic soil development—no action required	9/25/2015
23	Concrete chunks	Free released and disposed	3/19/2015
24	Tree fell on deer fence	Tree removed, fence repaired	7/30/2015
25	Metal stakes	Metal stakes removed	7/30/2015
26	Asphalt	To be addressed	NA
27	Concrete	Free released and disposed	3/19/2015
28	Metal bands	To be addressed	NA

Abbreviations:
NA = Not Applicable

Table D-15. East Quadrant Site Inspection Findings, February 2015

Map Number	Inspection Description	Finding Resolution or Path Forward	Date Resolved
1	Black tree tubes need removed	Tree tubes removed	8/4/2015
2	Honeysuckle	To be addressed	NA
3	Hole in lower half of deer fence	Fence repaired	7/30/2015
4	Hole in middle of deer fence	Fence repaired	7/30/2015
5	Hole in the middle of the deer fence at the tree	Fence repaired	7/30/2015
6	"Uneven Terrain" sign is broken	Sign replaced	5/20/2015
7	Drain pipe into drainage ditch—note on map for Configuration Management	Location noted on map	3/12/2015
8	Geotextile—needs cleaned up but it is stuck in the ground	Material removed	8/4/2015
9	Fresh erosion on bank—possibly from muskrats	To be addressed	NA
10	Trash—buried	Items removed	8/5/2015
11	Thick ground cover—possibly Japanese stilt grass	Ground cover mowed	9/24/2015
12	Concrete	Free released and disposed	9/24/2015
13	Old road cone/damaged culvert concrete	Free released and disposed	4/30/2015
14	Water collecting around well pads—terrain needs altered to drain surface water away from wells	To be addressed	NA
15	Discarded clothing	Unable to locate	10/15/2015
16	Broken piece of pipe	Unable to locate	10/15/2015
17	Plastic bands	Trash removed	8/31/2015
18	Fence is down	Non-DOE property—no action required	10/29/2015
19	Concrete	Free released and disposed	4/1/2015
20	Asphalt pile overgrown	Free released and disposed	8/27/2015
21	Geotextile material	To be addressed	NA
22	Concrete slab	To be addressed	NA
23	Big hole in fence	Fence repaired	7/30/2015

Abbreviations:
NA = Not Applicable

Table D-16. West Quadrant Site Inspection Findings, February 2015

Map Number	Inspection Finding Description	Finding Resolution or Path Forward	Date Resolved
1	Hole in fence	To be addressed	NA
2	Corner brace of fence is down	To be addressed	NA
3	Green 5-gallon bucket	To be addressed	NA
4	Old cages cutting into bark of trees—cages need to be removed	To be addressed	NA
5	Old cages	To be addressed	NA
6	Old cages	To be addressed	NA
7	Hole in deer fence	To be addressed	NA
8	Damage to fence	To be addressed	NA
9	Snow fence around well is down	To be addressed	NA
10	Hole in fence	To be addressed	NA
11	Hole in fence	To be addressed	NA
12	Hole in fence	To be addressed	NA
13	Hole in fence	To be addressed	NA

Abbreviations:
NA = Not Applicable

Table D-17. 2015 OSDF Inspection Findings, March 11, 2015

Map Number	Inspection Finding Description	Finding Resolution or Path Forward	Date Resolved[a]
1	Cedar	Woody vegetation removed	3/31/2015
2	Cedar	Woody vegetation removed	3/31/2015
3	2-foot section of barbed wire	Barbed wire removed	8/27/2015
4	Cedar	Woody vegetation removed	3/31/2015
5	Cedar	Woody vegetation removed	3/31/2015
6	Cedar	Woody vegetation removed	3/31/2015
7	Asphalt	Free released and disposed	3/31/2015
8	Trees, shrubs, vines in fence	Herbicide applied	7/30/2015
9	Geomembrane material	Free released and disposed	3/19/2015
10	Dogwood	Herbicide applied	7/30/2015
11	Cedar	Woody vegetation removed	3/31/2015
12	Metal pipe in ground and hole under fence	To be addressed	NA
13	Rebar, base of post exposed	Soil added to base of fence posts	6/12/2015
14	Thistle	Herbicide applied	6/11/2015
15	Thistle	Herbicide applied	6/11/2015
16	Teasel	To be addressed	NA
17	Erosion under fence post	Erosion repaired	6/15/2015
18	Large burrowing animal hole	Animal burrow filled with soil	6/15/2015
19	Concrete, asphalt, metal	Debris free released and disposed	8/27/2015
20	Field of bull thistle	To be addressed	NA
21	Thistle	Herbicide applied	6/11/2015
22	Callery pear	Herbicide applied	7/30/2015
23	Woody vegetation (4)	Herbicide applied	7/30/2015
24	Cedar	Woody vegetation removed	3/31/2015
25	Large piece of concrete	Free released and disposed	5/7/2015
26	Animal burrow	Filled hole	7/30/2015
27	Animal burrow	Filled hole	7/30/2015
28	Cedar	Woody vegetation removed	3/31/2015
29	Cedar	Woody vegetation removed	3/31/2015
30	Woody vegetation	Herbicide applied	7/30/2015
31	Owl box damaged	Replaced roof on owl box	5/26/2015
32	Woody vegetation	Herbicide applied	7/30/2015
33	Asphalt	Free released and disposed	3/19/2015
34	Brick	Free released and disposed	3/19/2015

Table D-18. OSDF Inspection Finding, June 3, 2015

Map Number	Inspection Finding Description	Finding Resolution or Path Forward	Date Resolved
1	Teasel patch	Herbicide applied	6/18/2015
2	Honeysuckle and Callery pear	Herbicide applied	6/18/2015
3	Cedar and ash trees	Herbicide applied	6/18/2015
4	Honeysuckle and Callery pear	Herbicide applied	6/18/2015
5	Callery pear, teasel, thistle and a metal gate stop	Herbicide applied	6/18/2015
6	Teasel patch	Herbicide applied	6/18/2015
7	Hackberry, honeysuckle, Callery pear	Herbicide applied	6/18/2015
8	Bull thistle, teasel, Callery pear	Herbicide applied	6/18/2015
9	Callery pear and honeysuckle	Herbicide applied	6/18/2015
10	Teasel	Herbicide applied	6/18/2015
11	Bull thistle, Callery pear, honeysuckle, Canada thistle	Herbicide applied	6/18/2015
12	Canada thistle, honeysuckle, Callery pear, musk thistle	Herbicide applied	6/18/2015
13	Callery pear, honeysuckle, cherry, thistle	Herbicide applied	6/18/2015
14	Callery pear, honeysuckle, thistle	Herbicide applied	6/18/2015
15	Box elder, willow, thistle, Callery pear, honeysuckle	Herbicide applied	6/18/2015
16	Ash, cottonwood, poison ivy	Herbicide applied	6/18/2015
17	Honeysuckle, Callery pear, willow, cottonwood	Herbicide applied	6/23/2015
18	Japanese honeysuckle, ash, Callery pear, cedar, Canada thistle	Herbicide applied	6/23/2015
19	Callery pear and honeysuckle	Herbicide applied	6/23/2015
20	Callery pear, cherry, dogwood	Herbicide applied	6/23/2015
21	Canada thistle	Herbicide applied	6/23/2015
22	Musk thistle	Herbicide applied	6/23/2015
23	Thistle, Callery pear, honeysuckle, cedar	Herbicide applied	6/23/2015
24	Scattered musk thistle	To be addressed	NA
25	Honeysuckle, Canada thistle, Callery pear, musk thistle, multiflora rose	To be addressed	NA
26	Honeysuckle	To be addressed	NA
27	Woody species, invasives, thistle	To be addressed	NA
28	Scattered musk thistle	Herbicide applied	6/11/2015
29	Teasel	To be addressed	NA
30	Scattered musk thistle	Herbicide applied	6/11/2015
31	Ends of abandoned leachate are open	Abandoned in place	9/25/2015
32	Musk thistle	Herbicide applied	6/11/2015
33	Teasel	To be addressed	NA
34	Teasel and thistle	Herbicide applied	6/11/2015
35	Teasel, thistle, honeysuckle	Herbicide applied	7/15/2015
36	Woody vegetation	Herbicide applied	7/15/2015
37	Scattered musk thistle	Herbicide applied	6/11/2015
38	Callery pear	Herbicide applied	7/15/2015
39	Callery pear, teasel, ash	Herbicide applied	7/15/2015

Table 18 (continued). OSDF Inspection Finding, June 3, 2015

Map Number	Inspection Finding Description	Finding Resolution or Path Forward	Date Resolved
40	Woody species and teasel	Herbicide applied	7/15/2015
41	Honeysuckle	Herbicide applied	7/15/2015
42	Honeysuckle	To be addressed	NA
43	Bull thistle	Herbicide applied	7/7/2015
44	Honeysuckle	Herbicide applied	7/7/2015
45	Honeysuckle	Herbicide applied	7/7/2015
46	Honeysuckle	Herbicide applied	7/7/2015
47	Honeysuckle	Herbicide applied	7/7/2015
48	Honeysuckle	Herbicide applied	7/7/2015
49	Cedar	Woody vegetation removed	6/18/2015
50	2 cherry trees and 1 ash further east	Herbicide applied	6/18/2015
51	Woody vegetation	Herbicide applied	6/18/2015
52	Honeysuckle	Herbicide applied	7/7/2015
53	Grape vine, Virginia creeper, honeysuckle	To be addressed	NA
54	Honeysuckle, Virginia creeper	To be addressed	NA
55	Honeysuckle	Herbicide applied	7/7/2015
56	Woody vegetation	Herbicide applied	7/7/2015
57	Willow	Herbicide applied	7/7/2015
58	Honeysuckle	Herbicide applied	7/7/2015
59	Thistle	Herbicide applied	7/7/2015
60	Woody vegetation × 2	Herbicide applied	7/7/2015
61	Woody vegetation × 3 (cottonwood)	Herbicide applied	7/7/2015
62	Thistle	Herbicide applied	6/11/2015
63	Thistle	Herbicide applied	6/11/2015
64	Thistle, teasel, honeysuckle, crown vetch	Herbicide applied	7/15/2015

Abbreviations:
NA = not applicable

Table D-19. OSDF Inspection Findings, September 2 and 3, 2015

Map Number	Inspection Finding	Finding Resolution or Path Froward	Date Resolved
1	Elm tree	Herbicide applied	9/24/2015
2	Grape vine	Herbicide applied	9/24/2015
3	Grape vine, Callery pear, poison ivy, hackberry	Herbicide applied	9/24/2015
4	Honeysuckle and black cherry	Herbicide applied	9/24/2015
5	Honeysuckle	Herbicide applied	9/24/2015
6	Honeysuckle	Herbicide applied	9/24/2015
7	Mulberry, hackberry, honeysuckle	Herbicide applied	9/24/2015
8	Hackberry	Herbicide applied	9/24/2015
9	Woody vegetation	Herbicide applied	9/24/2015
10	Poison ivy	Herbicide applied	9/24/2015
11	Grape vine	Herbicide applied	9/24/2015
12	Woody vegetation	Herbicide applied	9/24/2015
13	Honeysuckle	Herbicide applied	9/24/2015
14	Canada thistle	To be addressed	NA
15	Canada thistle	To be addressed	NA
16	Dogwood and honeysuckle	Herbicide applied	9/24/2015
17	Honeysuckle	Herbicide applied	9/24/2015
18	Cherry tree	Herbicide applied	9/24/2015
19	Honeysuckle	Herbicide applied	9/24/2015
20	Cottonwood tree	Herbicide applied	9/24/2015
21	Grape vine	Herbicide applied	9/24/2015
22	Honeysuckle	Herbicide applied	9/24/2015
23	Willow	To be addressed	NA
24	Callery pear	Herbicide applied	12/17/2015
25	Woody vegetation on rip rap slope	Herbicide applied	9/24/2015
26	Willow in cattails	Herbicide applied	9/24/2015
27	Callery pear	Herbicide applied	12/17/2015
28	Honeysuckle	Herbicide applied	9/24/2015
29	Callery pear	Herbicide applied	9/24/2015
30	Grape vine	Herbicide applied	9/24/2015
31	Honeysuckle	Herbicide applied	9/24/2015
32	Hole under fence	To be addressed	NA
33	Cottonwood	To be addressed	NA
34	Thistle	To be addressed	NA
35	Honeysuckle	To be addressed	NA
36	Various woody vegetation	Herbicide applied	9/24/2015
37	Honeysuckle growing into fence	To be addressed	NA
38	Teasel	To be addressed	NA
39	Green ash	Herbicide applied	9/24/2015
40	Honeysuckle and Callery pear	Herbicide applied	9/24/2015
41	Honeysuckle	Herbicide applied	9/24/2015

Abbreviations:
NA = not applicable

Table D-20. OSDF Inspection Findings, December 2, 2015

Map Number	Inspection Findings	Finding Resolution or Path Forward	Date Resolved
1	Woody vegetation	To be addressed	NA
2	Woody vegetation	To be addressed	NA
3	Woody vegetation	To be addressed	NA
4	Woody vegetation	To be addressed	NA
5	Woody vegetation	To be addressed	NA
6	Woody vegetation	Herbicide applied	12/16/2015
7	Thistle	To be addressed	NA
8	Woody vegetation	Herbicide applied	12/16/2015
9	Woody vegetation (numerous)	Herbicide applied	12/10/2015
10	Woody vegetation	Herbicide applied	12/10/2015
11	Woody vegetation	Herbicide applied	12/16/2015
12	Woody vegetation	Herbicide applied	12/16/2015
13	Woody vegetation	Herbicide applied	12/16/2015
14	Woody vegetation	Herbicide applied	12/16/2015
15	Woody vegetation	Herbicide applied	12/16/2015
16	Woody vegetation	Herbicide applied	12/16/2015
17	Woody vegetation	To be addressed	NA
18	Woody vegetation	To be addressed	NA
19	Woody vegetation	To be addressed	N
20	Woody vegetation	Herbicide applied	12/9/2015
21	Cedar and Callery pear	Herbicide applied	12/9/2015
22	Japanese honeysuckle	Herbicide applied	12/10/2015
23	Teasel and Callery pear	Herbicide applied	12/10/2015
24	Teasel	To be addressed	NA
25	Teasel	To be addressed	NA
26	Groundhog hole and teasel	To be addressed	NA
27	Several groundhog holes	To be addressed	NA
28	Callery pear trees	Herbicide applied	12/10/2015
29	Cherry and Callery pear trees	Herbicide applied	12/17/2015
30	Teasel	To be addressed	NA
31	Teasel	To be addressed	NA
32	Teasel	To be addressed	NA
33	Callery pear	Herbicide applied	12/17/2015
34	Woody vegetation	Herbicide applied	12/17/2015
35	Callery pear	Herbicide applied	12/17/2015
36	Woody vegetation	Herbicide applied	12/17/2015
37	Teasel patches	To be addressed	NA
38	Large amount of ground cover	To be addressed	NA
39	Callery pear	Herbicide applied	12/16/2015
40	Woody vegetation	Herbicide applied	12/16/2015
41	Honeysuckle	Herbicide applied	12/16/2015

Table 20 (continued). OSDF Inspection Findings, December 2, 2015

Map Number	Inspection Findings	Finding Resolution or Path Forward	Date Resolved
42	Callery pear	Herbicide applied	12/16/2015
43	Callery pear and teasel	Herbicide applied	12/16/2015
44	Teasel	To be addressed	NA
45	Honeysuckle	To be addressed	NA
46	Cedar	Woody vegetation removed	12/17/2015
47	Thistle and black matting	To be addressed	NA
48	Callery pear	Herbicide applied	12/17/2015
49	Honeysuckle	To be addressed	NA
50	Honeysuckle	Herbicide applied	12/16/2015
51	Woody vegetation (large area)	Herbicide applied	12/16/2015
52	Animal burrow	To be addressed	NA
53	Woody vegetation (large area)	To be addressed	NA
54	Woody vegetation	Herbicide applied	12/17/2015
55	Unknown black plastic	To be addressed	NA
56	Callery pear	Herbicide applied	12/17/2015
57	Callery pear (multiple)	To be addressed	NA
58	Cedar	To be addressed	NA
59	Callery pear (multiple)	Herbicide applied	12/16/2015
60	Honeysuckle	Herbicide applied	12/16/2015
61	Honeysuckle	Herbicide applied	12/16/2015
62	Honeysuckle	Herbicide applied	12/16/2015
63	Large patch of teasel	To be addressed	NA
64	Geotextile fabric	To be addressed	NA
65	Woody vegetation	To be addressed	NA
66	Animal burrow	To be addressed	NA
67	Woody vegetation	Herbicide applied	12/11/2015
68	Woody vegetation	Herbicide applied	12/10/2015
69	Woody vegetation	To be addressed	NA
70	Woody vegetation	To be addressed	NA
71	Clay tile (3 inch × 5 inch)	To be addressed	NA
72	Woody vegetation—Callery pear	Herbicide applied	12/17/2015
73	Woody vegetation	Herbicide applied	12/17/2015
74	Woody vegetation (multiple)	Herbicide applied	12/17/2015
75	Woody vegetation (multiple)	To be addressed	NA
76	Woody vegetation—honeysuckle	To be addressed	NA
77	Teasel patch	To be addressed	NA
78	Woody vegetation	Herbicide applied	12/16/2015
79	Woody vegetation	Herbicide applied	12/16/2015
80	Woody vegetation—Callery pear and honeysuckle	Herbicide applied	12/16/2015
81	Woody vegetation	Herbicide applied	12/16/2015
82	Woody vegetation	Herbicide applied	12/16/2015

Table 20 (continued). OSDF Inspection Findings, December 2, 2015

Map Number	Inspection Findings	Finding Resolution or Path Forward	Date Resolved
83	Woody vegetation—honeysuckle	Herbicide applied	12/16/2015
84	Woody vegetation—honeysuckle	Herbicide applied	12/16/2015
85	Honeysuckle patch	To be addressed	NA
86	Woody vegetation—Callery pear and honeysuckle	To be addressed	NA
87	Woody vegetation	To be addressed	NA
88	Woody vegetation	Herbicide applied	12/16/2015
89	Woody vegetation	Herbicide applied	12/16/2015
90	Callery pear and honeysuckle	Herbicide applied	12/19/2015
91	Callery pear and honeysuckle	Herbicide applied	12/16/2015
92	Callery pear and honeysuckle	Herbicide applied	12/16/2015
93	Woody vegetation	To be addressed	NA
94	Woody and herbaceous invasive vegetation	Herbicide applied	12/17/2015
95	Cedar and Callery pear	Herbicide applied	12/17/2015
96	Callery pear	To be addressed	NA
97	Callery pear	To be addressed	NA
98	Callery pear	To be addressed	NA
99	Callery pear	To be addressed	NA
100	Callery pear	Herbicide applied	12/16/2015
101	Honeysuckle	Herbicide applied	12/10/2015
102	Honeysuckle	Herbicide applied	12/10/2015
103	Honeysuckle	To be addressed	NA
104	Woody vegetation (multiple)	To be addressed	NA
105	Woody vegetation (multiple)	To be addressed	NA
106	Erosion/burrow	To be addressed	NA
107	Callery pear	Herbicide applied	12/10/2015
108	Musk and bull thistle patches	To be addressed	NA
109	Honeysuckle and Callery pear	Herbicide applied	12/10/2015
110	Teasel	To be addressed	NA
111	Honeysuckle and Callery pear	Herbicide applied	12/10/2015
112	Teasel	To be addressed	NA
113	Callery pear	Herbicide applied	12/15/2015
114	Teasel	To be addressed	NA
115	Canada thistle	To be addressed	NA
116	Honeysuckle	Herbicide applied	12/16/2015
117	Honeysuckle	Herbicide applied	12/16/2015
118	Teasel and thistle	To be addressed	NA
119	Honeysuckle	Herbicide applied	12/16/2015
120	Callery pear	Herbicide applied	12/16/2015
121	Honeysuckle and dogwood	Herbicide applied	12/16/2015
122	Honeysuckle and Callery pear (multiple)	Herbicide applied	12/16/2015
123	Honeysuckle and Callery pear	Herbicide applied	12/17/2015

Table 20 (continued). OSDF Inspection Findings, December 2, 2015

Map Number	Inspection Findings	Finding Resolution or Path Forward	Date Resolved
124	Hole under fence (animal?)	Hole filled	12/31/2015
125	Canada thistle and teasel	To be addressed	NA
126	Callery pear and honeysuckle	Herbicide applied	12/17/2015
127	Teasel	To be addressed	NA
128	Teasel	To be addressed	NA
129	Unknown grass (invasive) and teasel	To be addressed	NA
130	Teasel and cedar	To be addressed	N
131	Honeysuckle and dogwood	Herbicide applied	12/10/2015
132	Callery pear and honeysuckle	Herbicide applied	12/10/2015
133	Teasel	To be addressed	NA
134	Cedars	Woody vegetation removed	12/10/2015
135	Teasel	To be addressed	NA
136	Groundhog and teasel	To be addressed	NA
137	Woody vegetation	To be addressed	NA
138	Groundhog hole and thistle	To be addressed	NA
139	Thistle	To be addressed	NA
140	Large patch of thistle	To be addressed	NA
141	Teasel patches	To be addressed	NA
142	Large thistle patch	To be addressed	NA
143	Large patch of teasel	To be addressed	NA
144	Thistle	To be addressed	NA

Abbreviations:
NA = Not Applicable

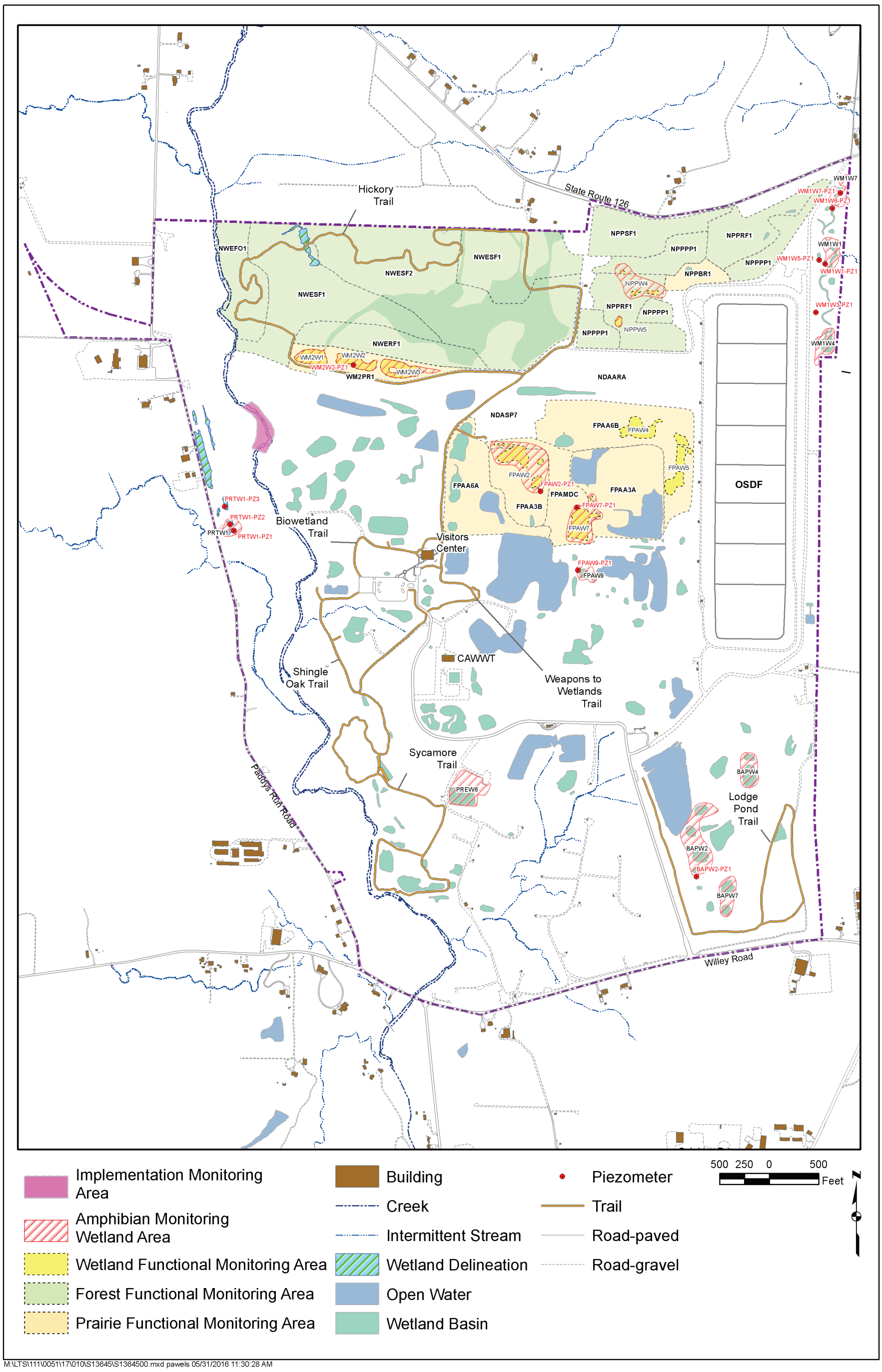

Figure D-1. Ecological Monitoring Activities

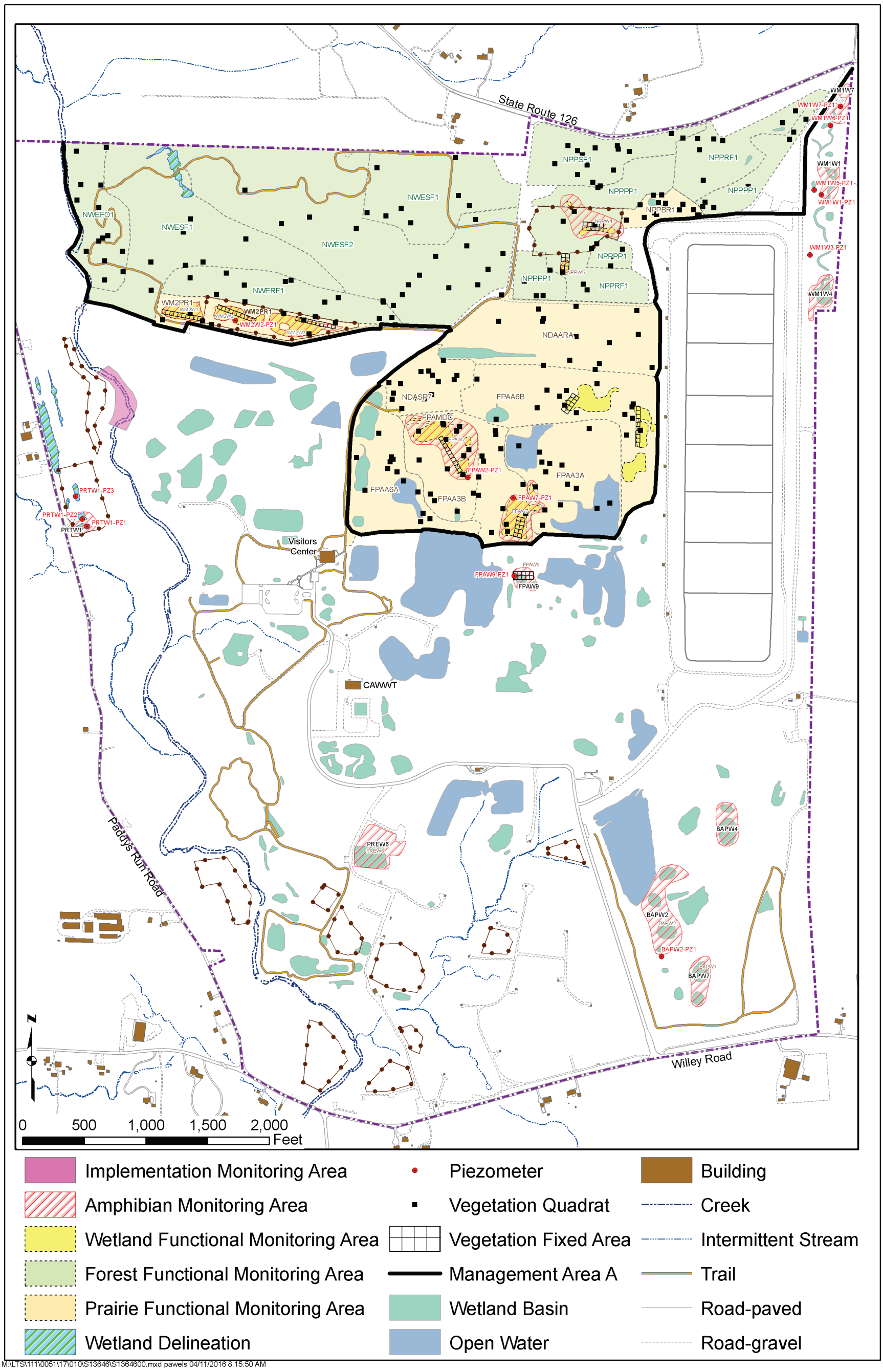

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Figure D-2. Ecological Monitoring Survey Areas—Northwest Site Quadrant

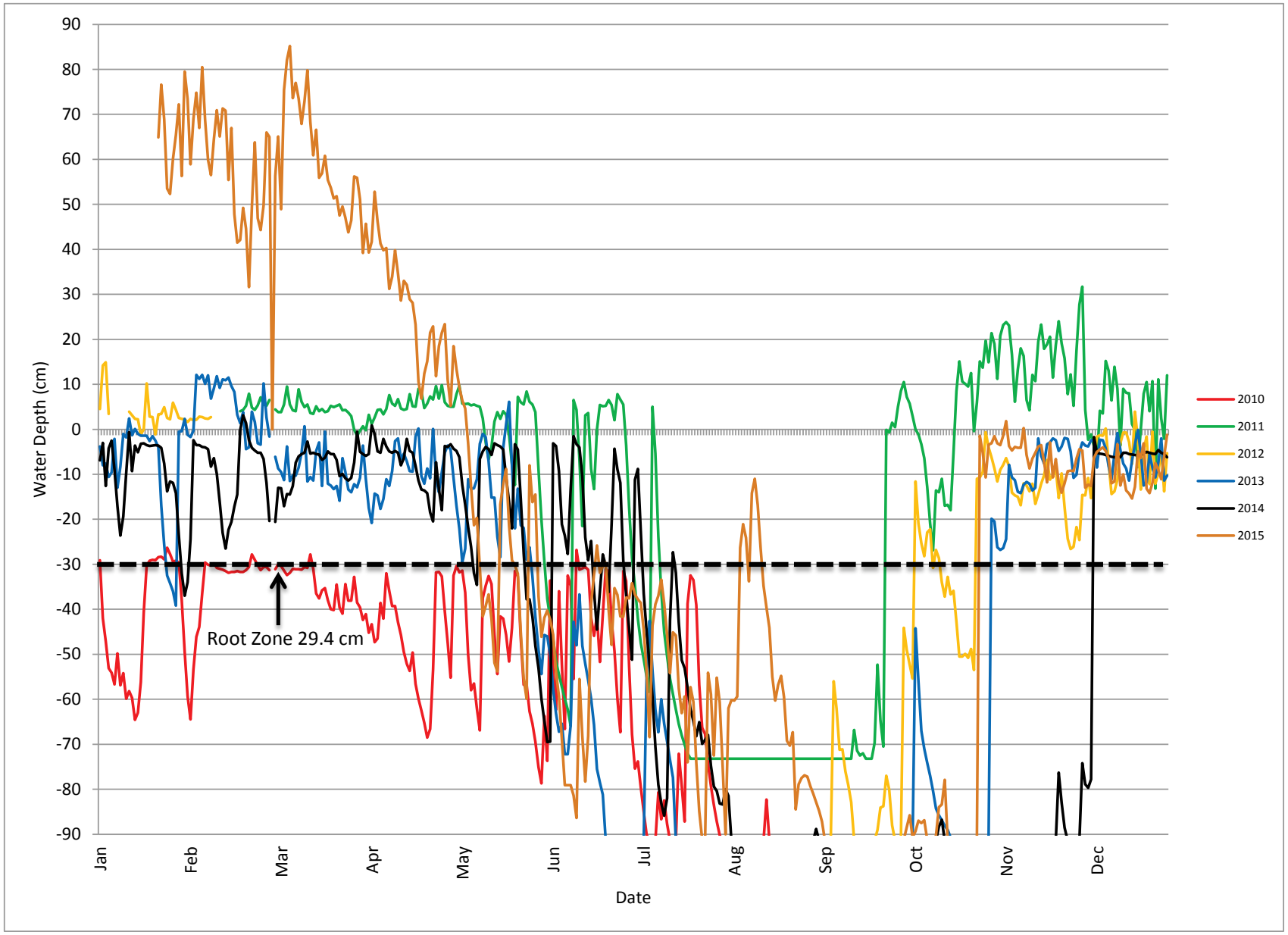

Figure D-3A. Wetland Area BAPW2 Hydrograph

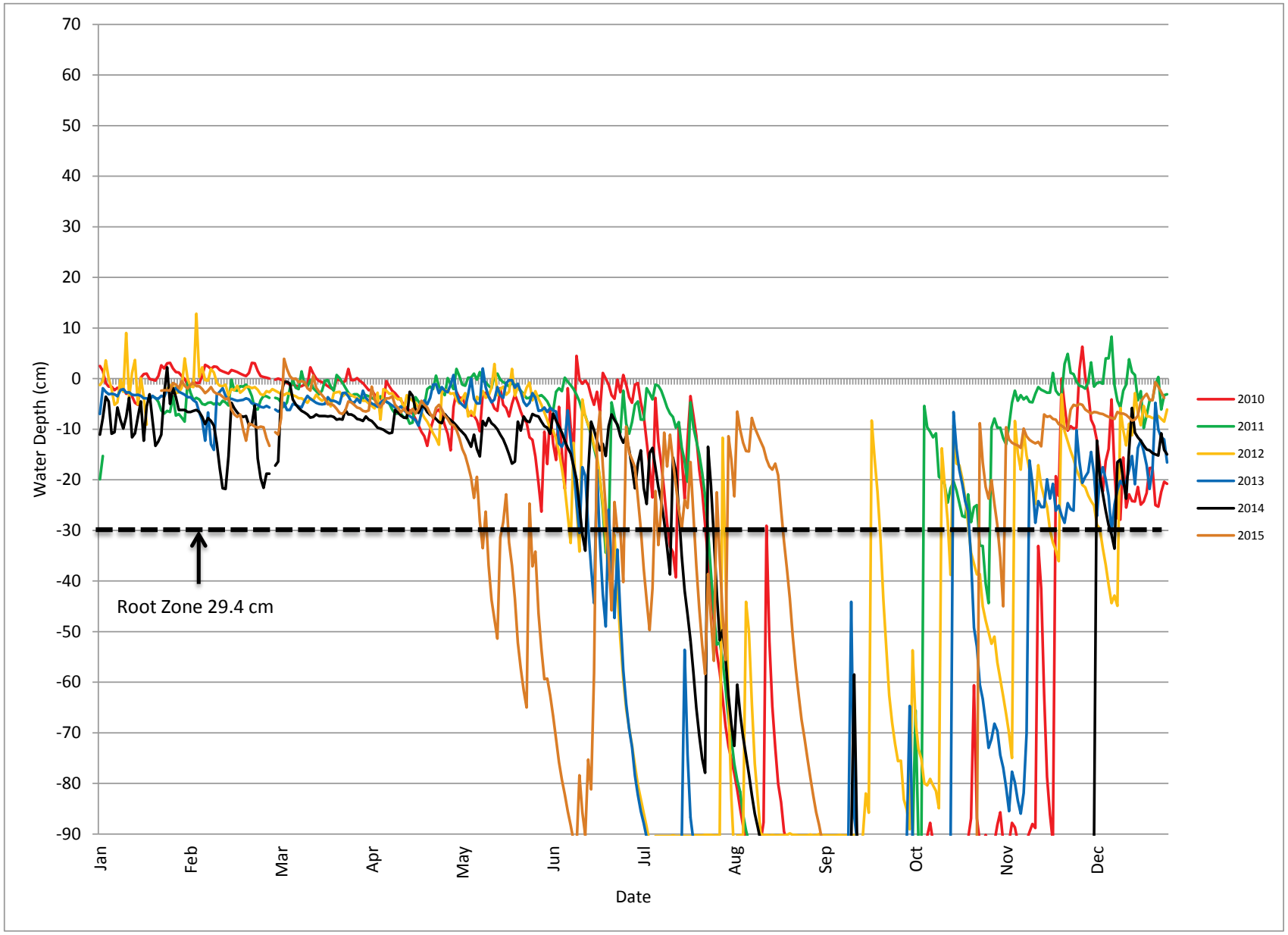

Figure D-3B. Wetland Area FPAW2 Hydrograph

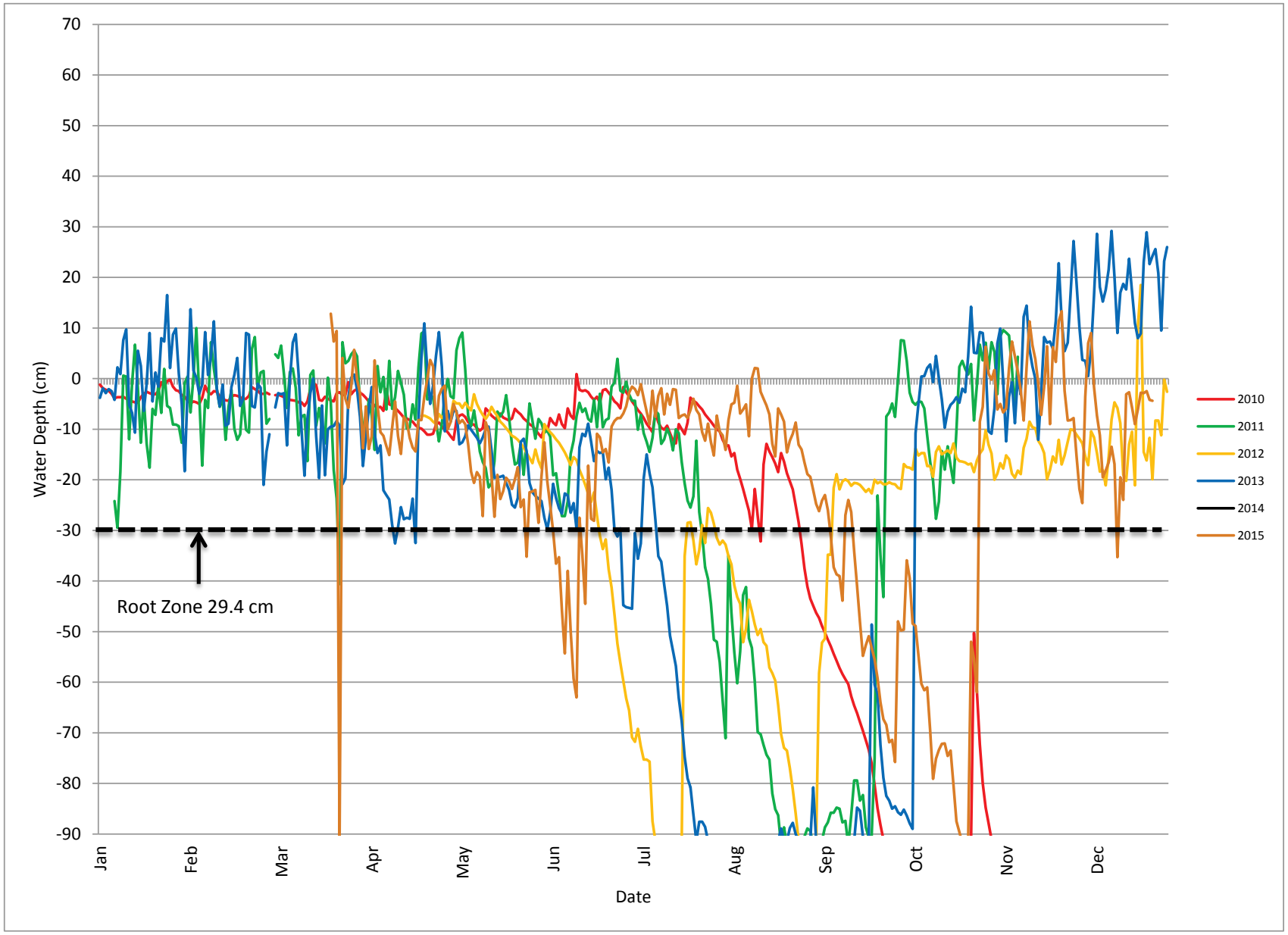

Figure D-3C. Wetland Area FPAW7 Hydrograph

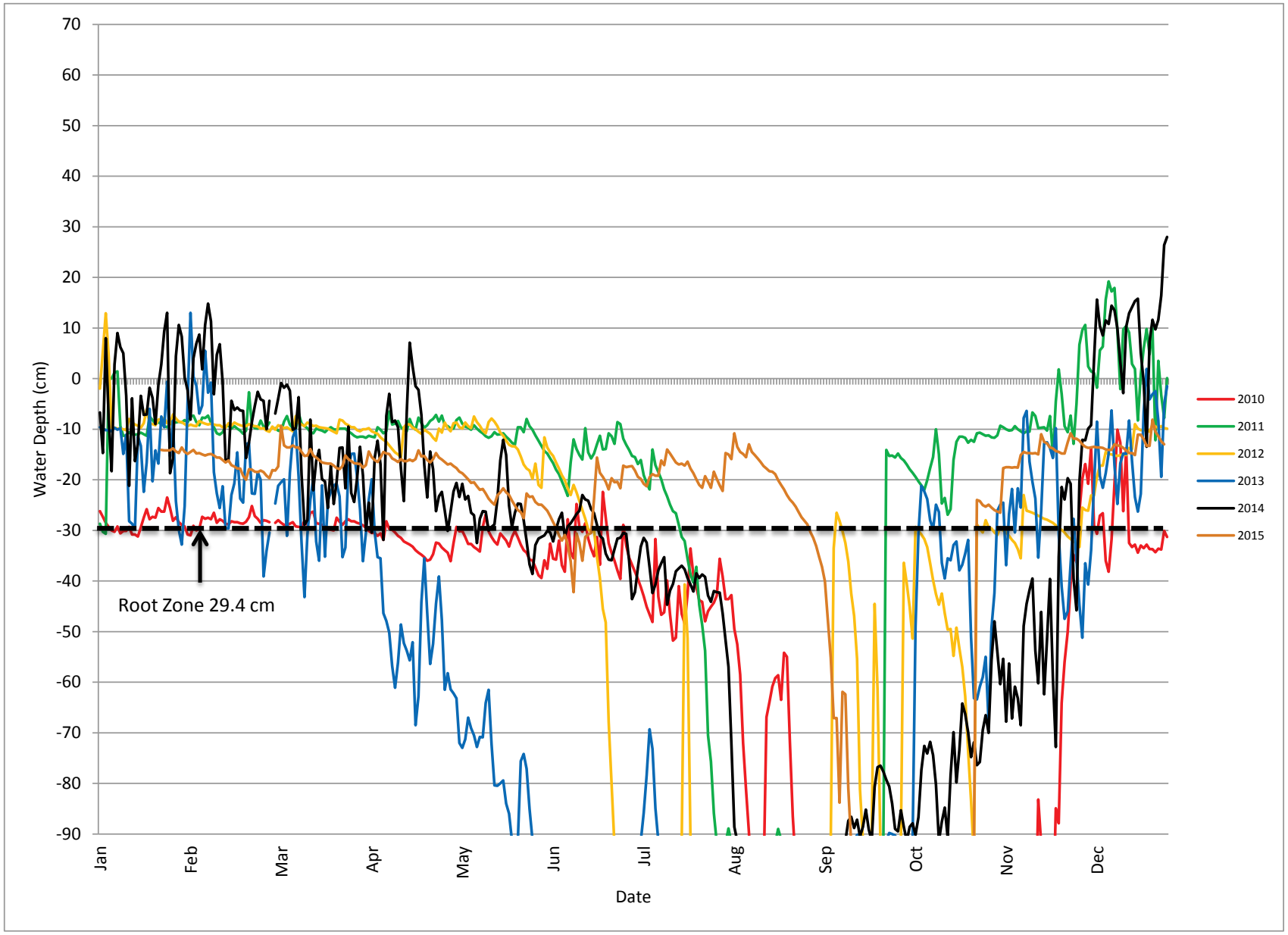

Figure D-3D. Wetland Area FPAW9 Hydrograph

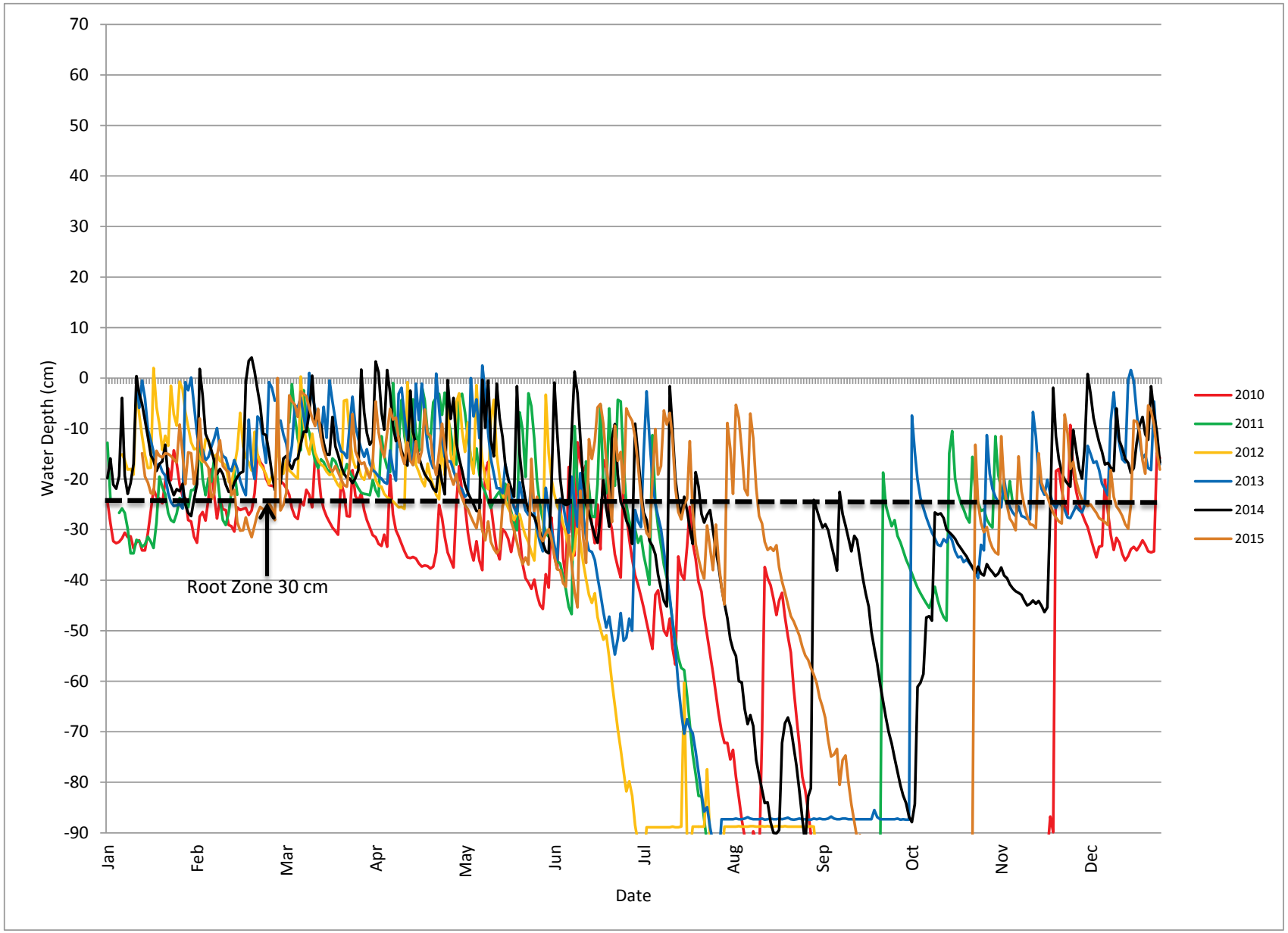

Figure D-3E. Wetland Area WM1W1 Hydrograph

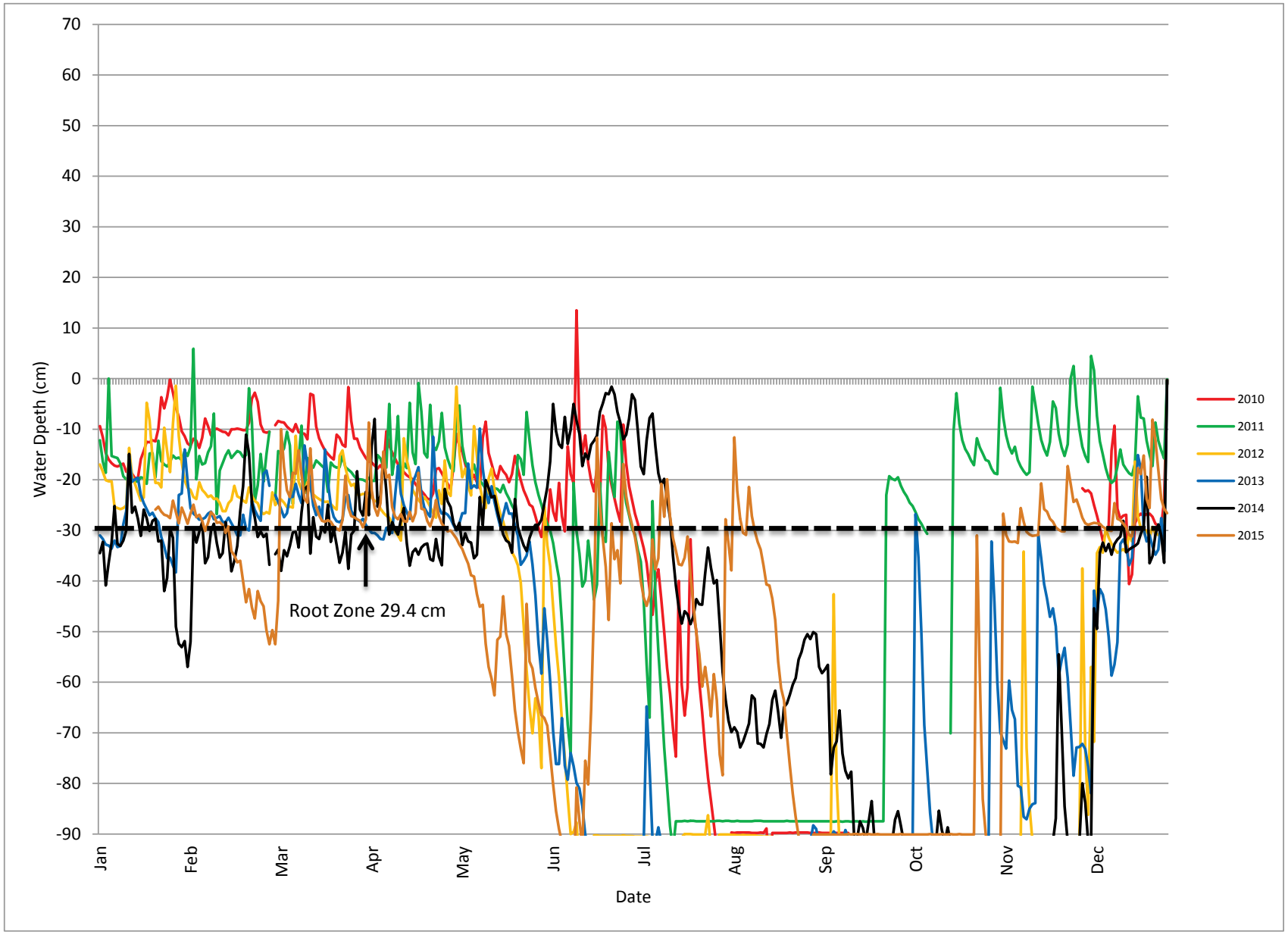

Figure D-3F. Wetland Area WM1W3 Hydrograph

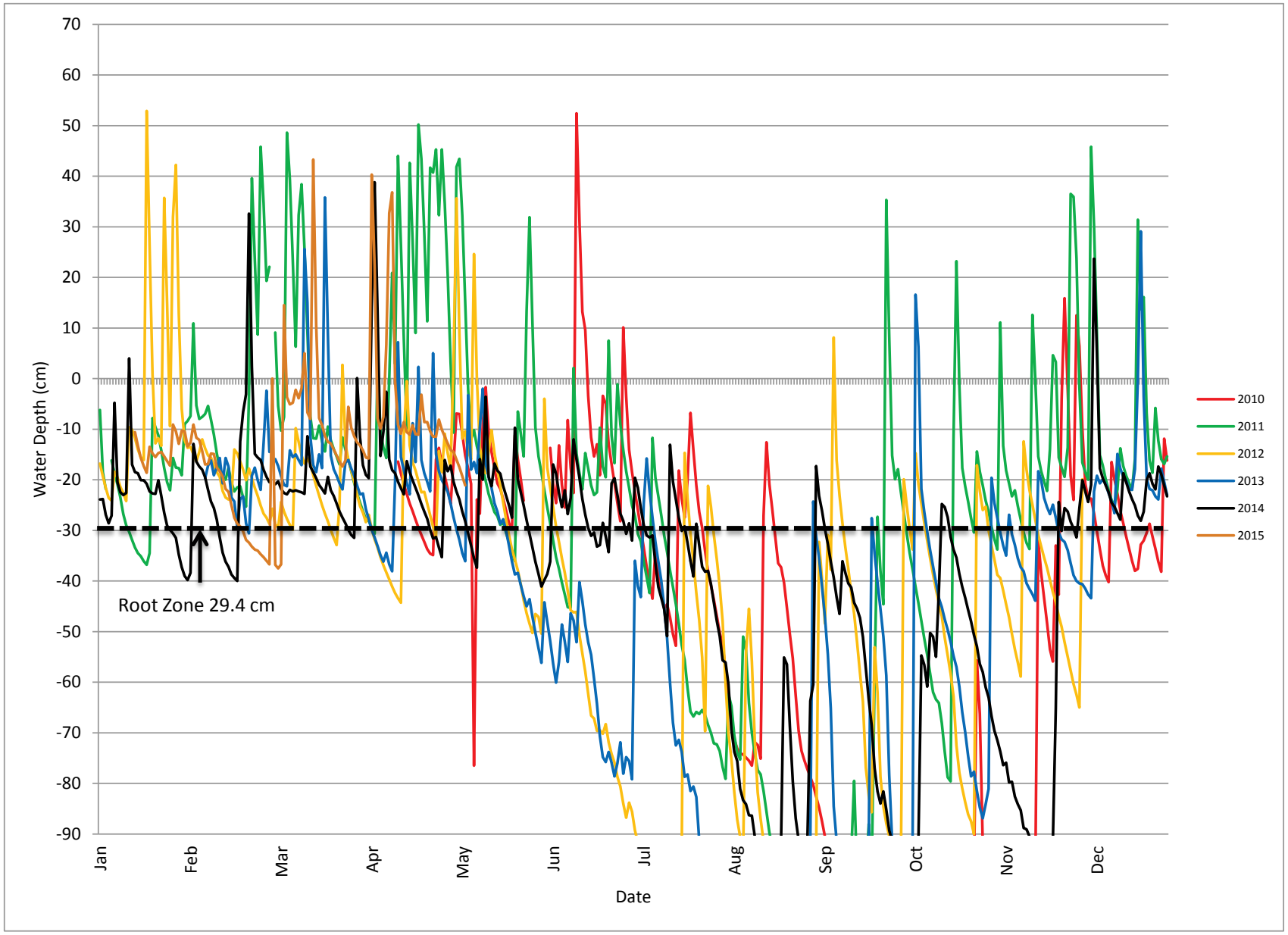

Figure D-3G. Wetland Area WM1W5 Hydrograph

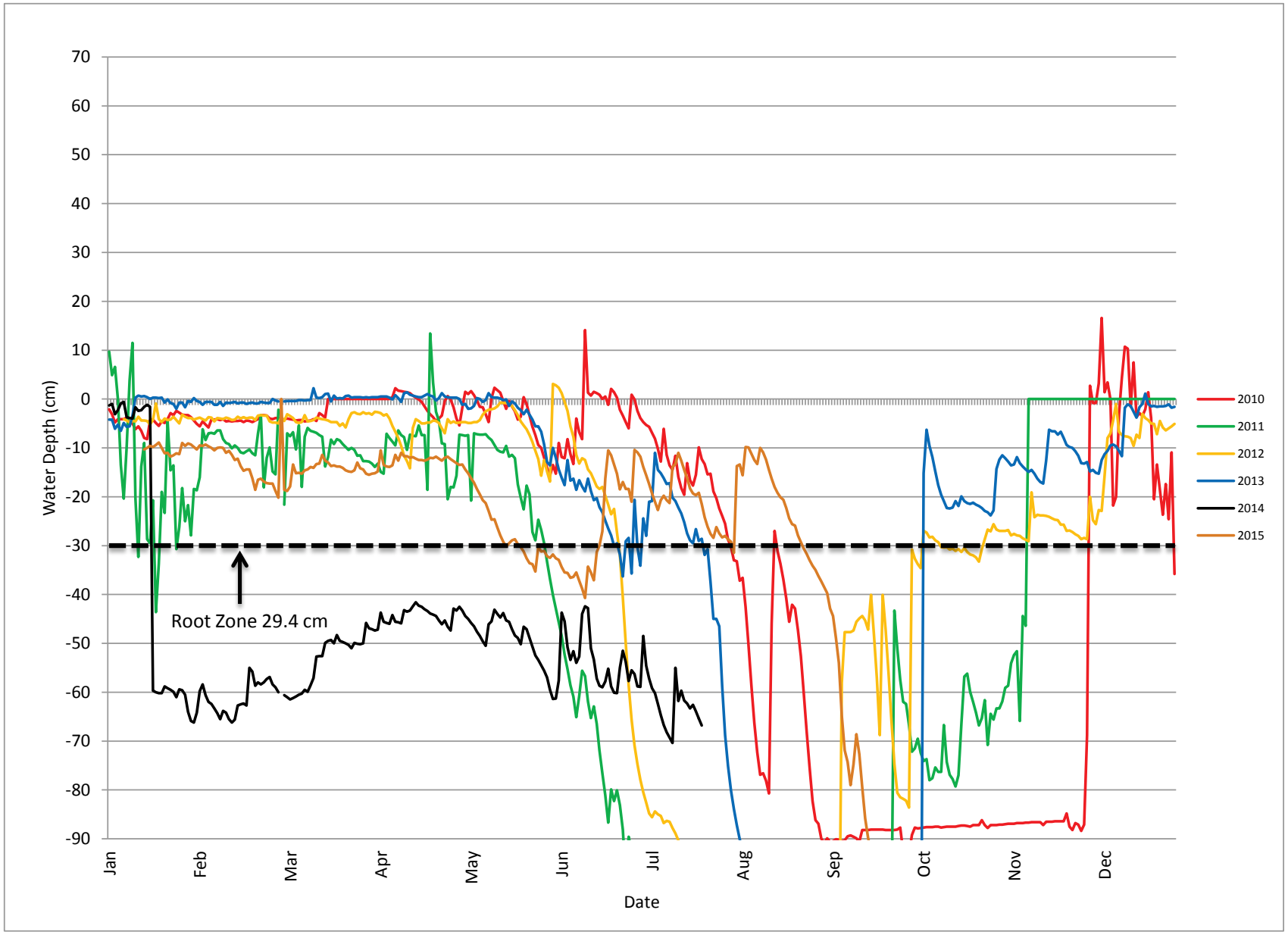

Figure D-3H. Wetland Area WM1W6 Hydrograph

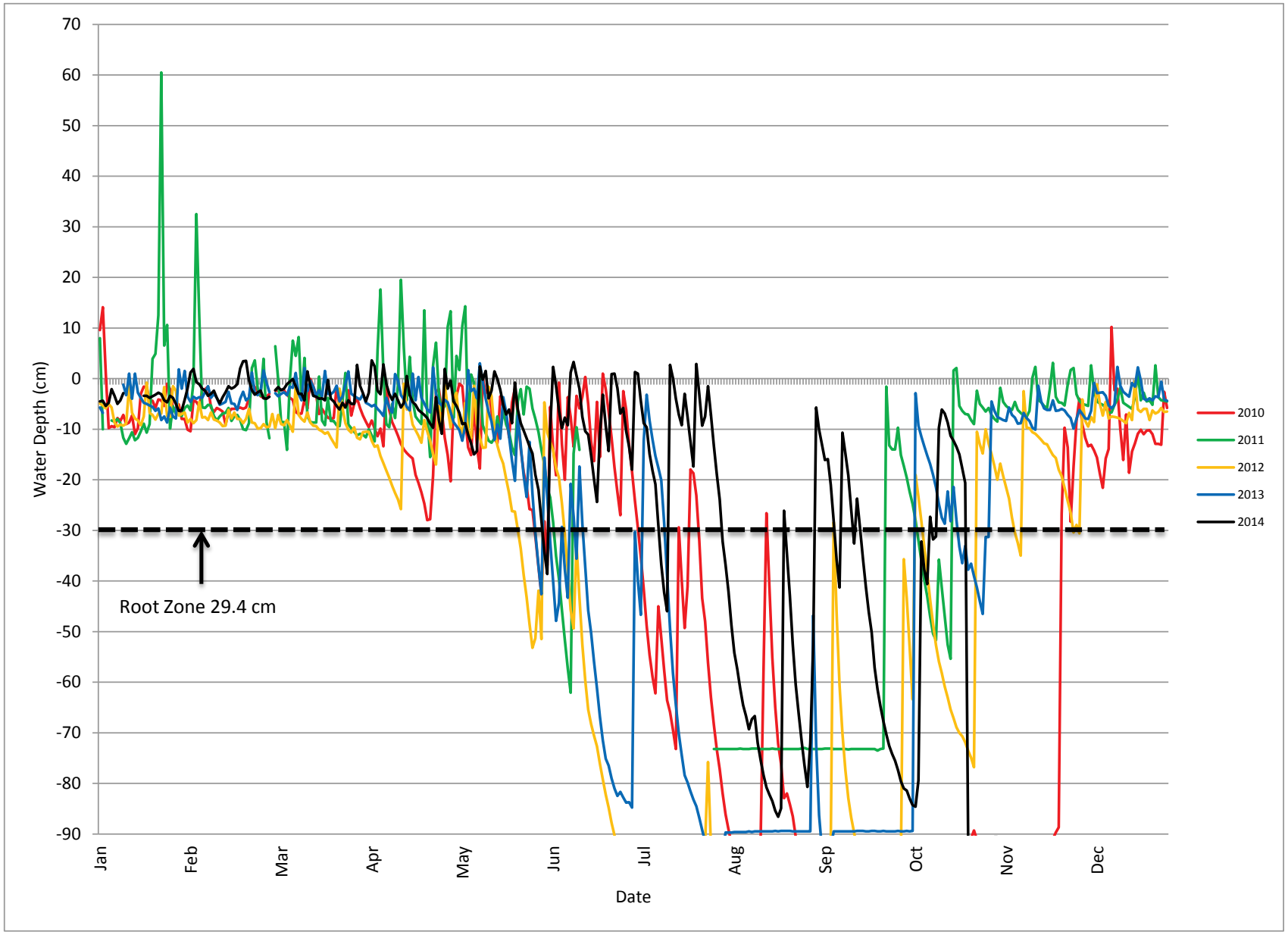

Figure D-3l. Wetland Area WM1W7 Hydrograph

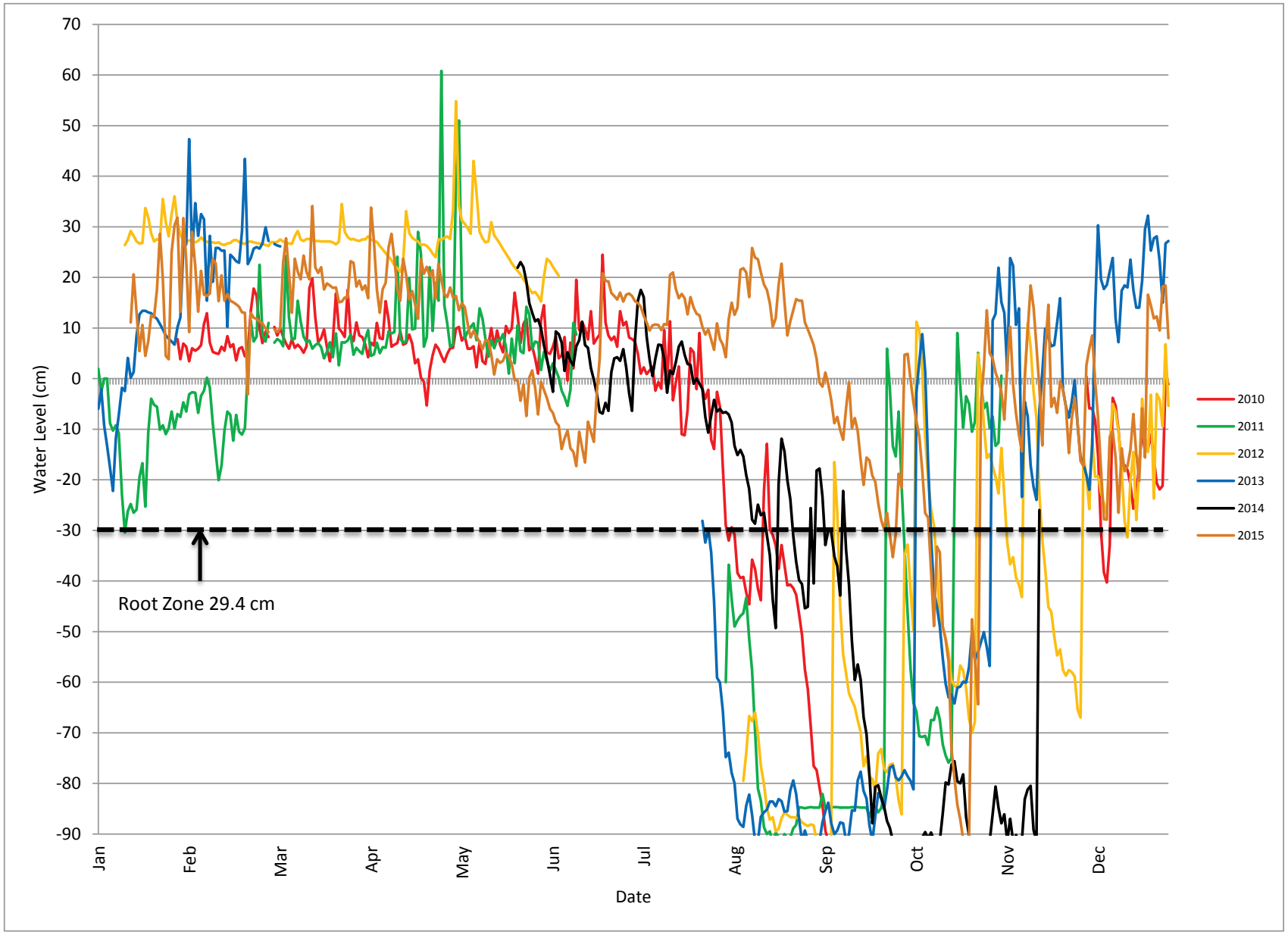

Figure D-3J. Wetland Area WM2W2 Hydrograph

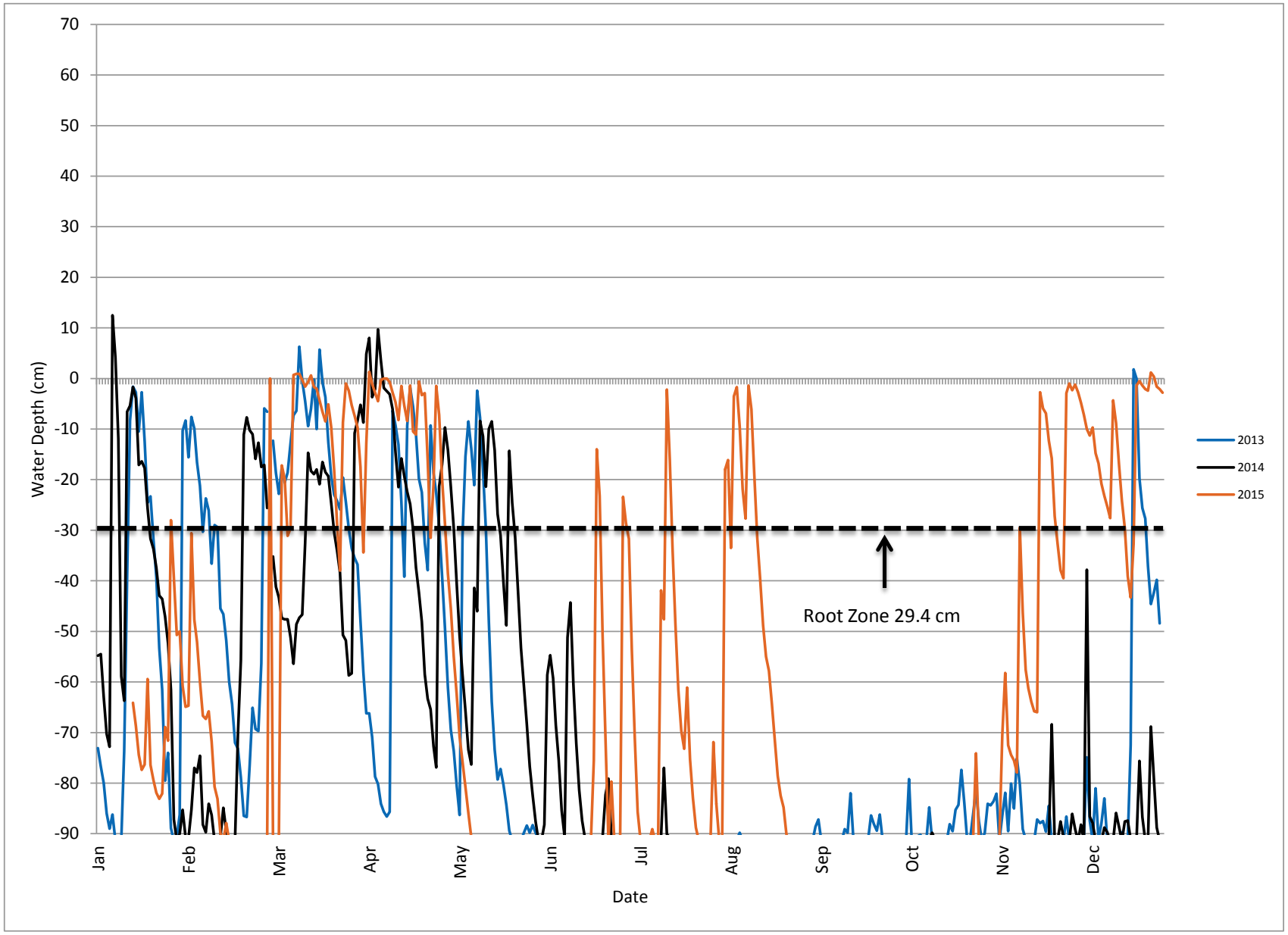

Figure D-3K. Wetland Area PRTW1 Hydrograph

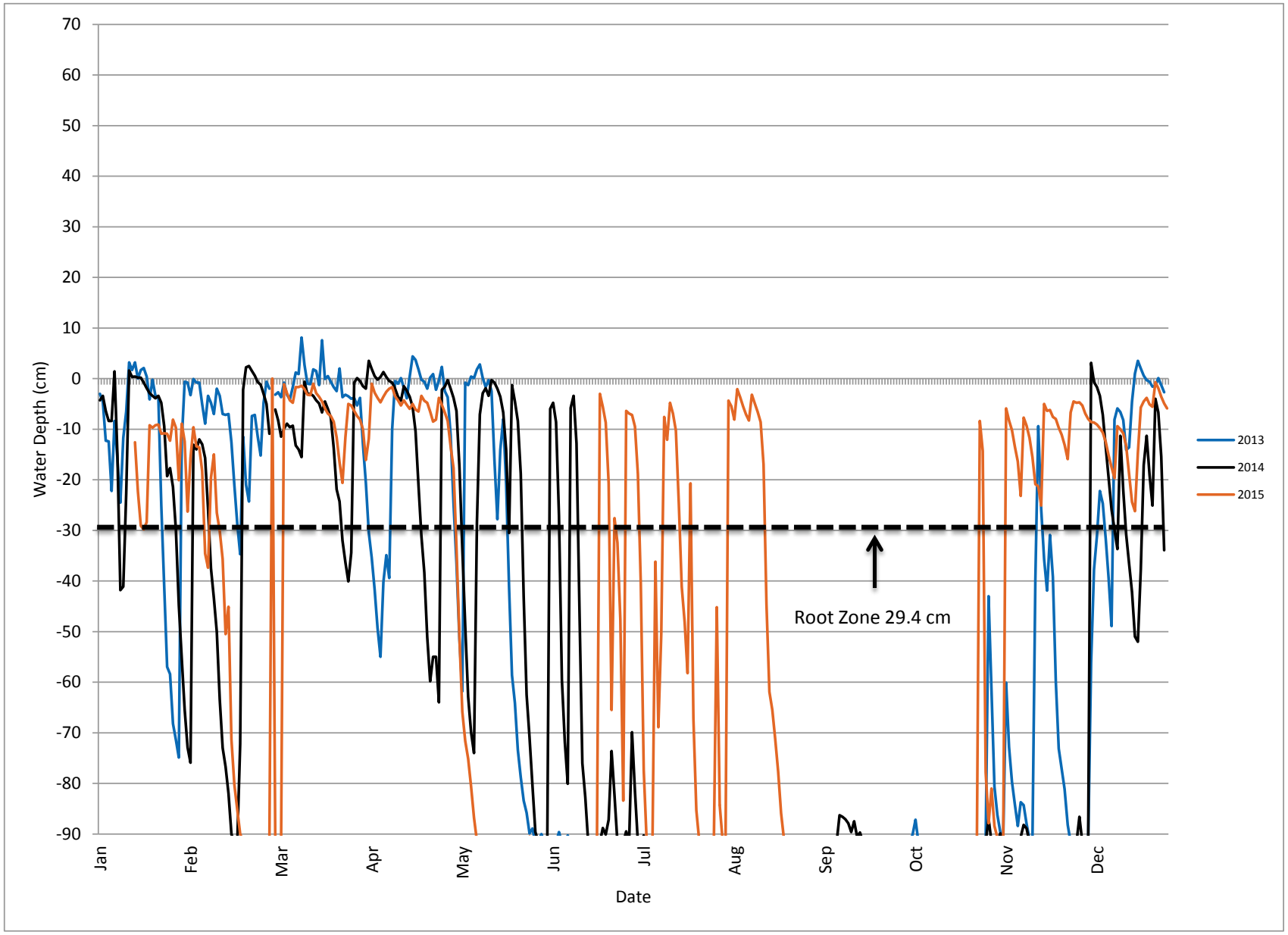

Figure D-3L. Wetland Area PRTW2 Hydrograph

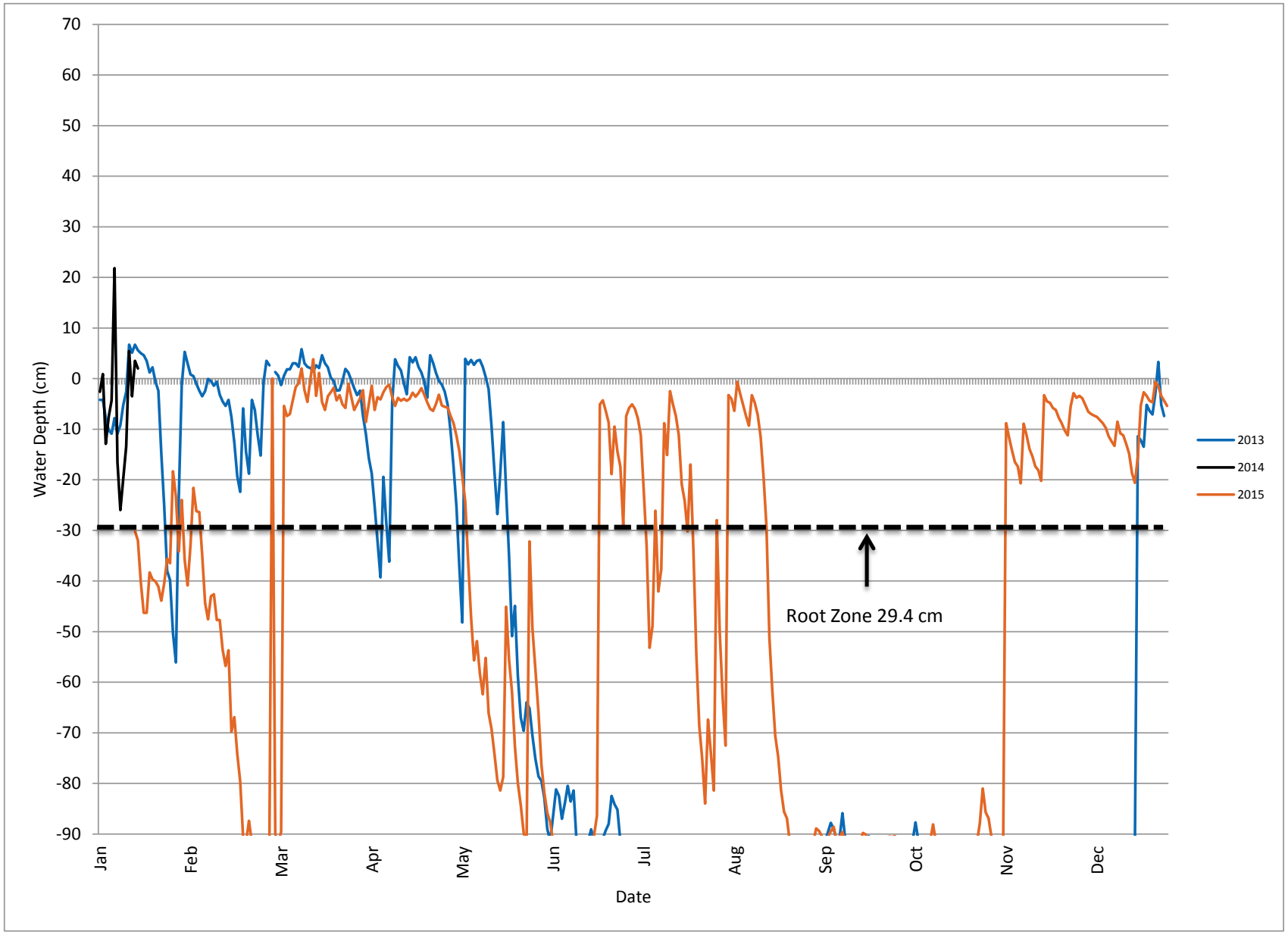

Figure D-3M. Wetland Area PRTW3 Hydrograph

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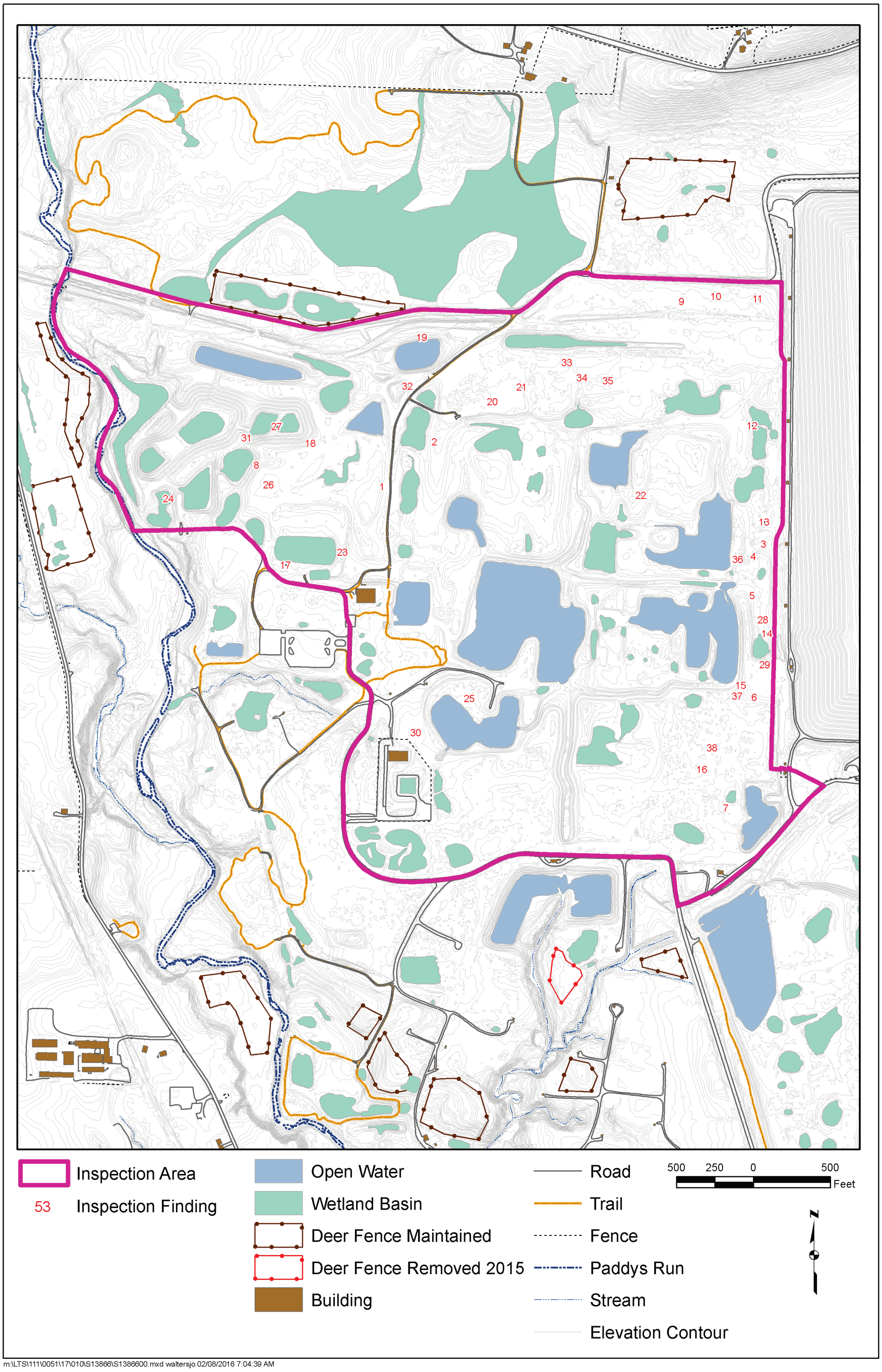

Figure D-4A. Central Quadrant Site Inspection Findings, January 2015

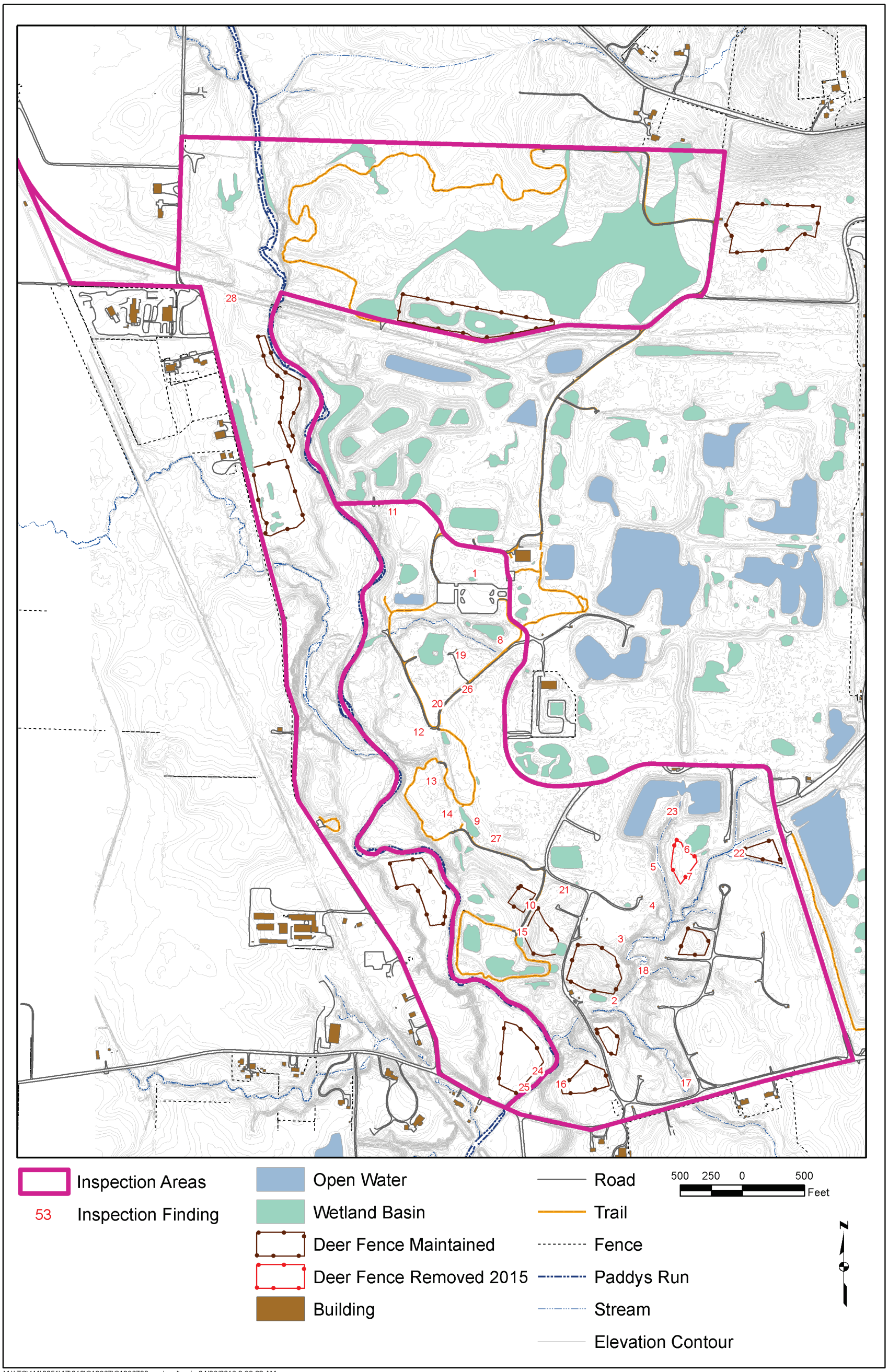

Figure D-4B. South Quadrant Site Inspection Findings, February 2015

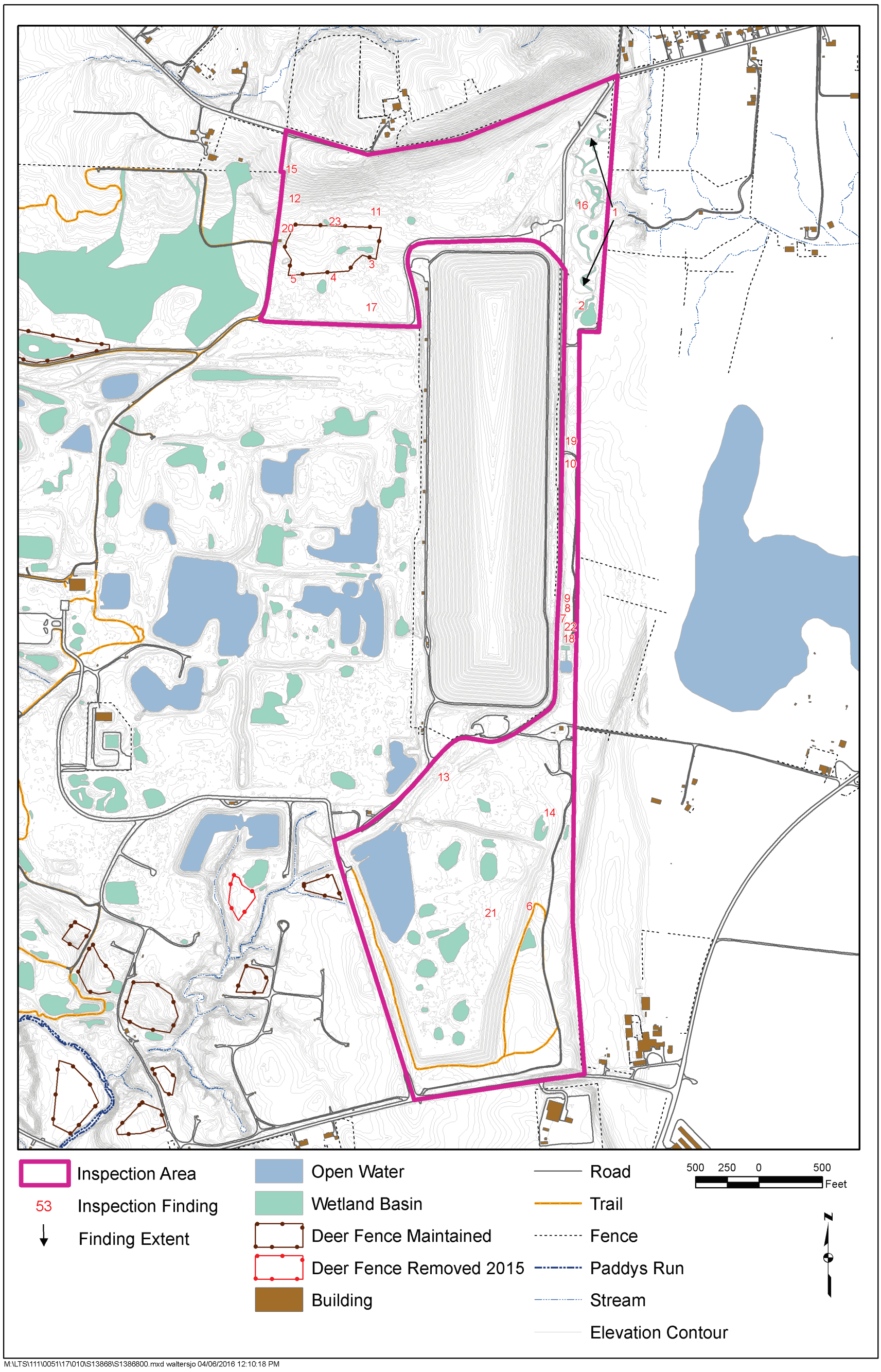

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Figure D-4C. East Quadrant Site Inspection Findings, March 2015

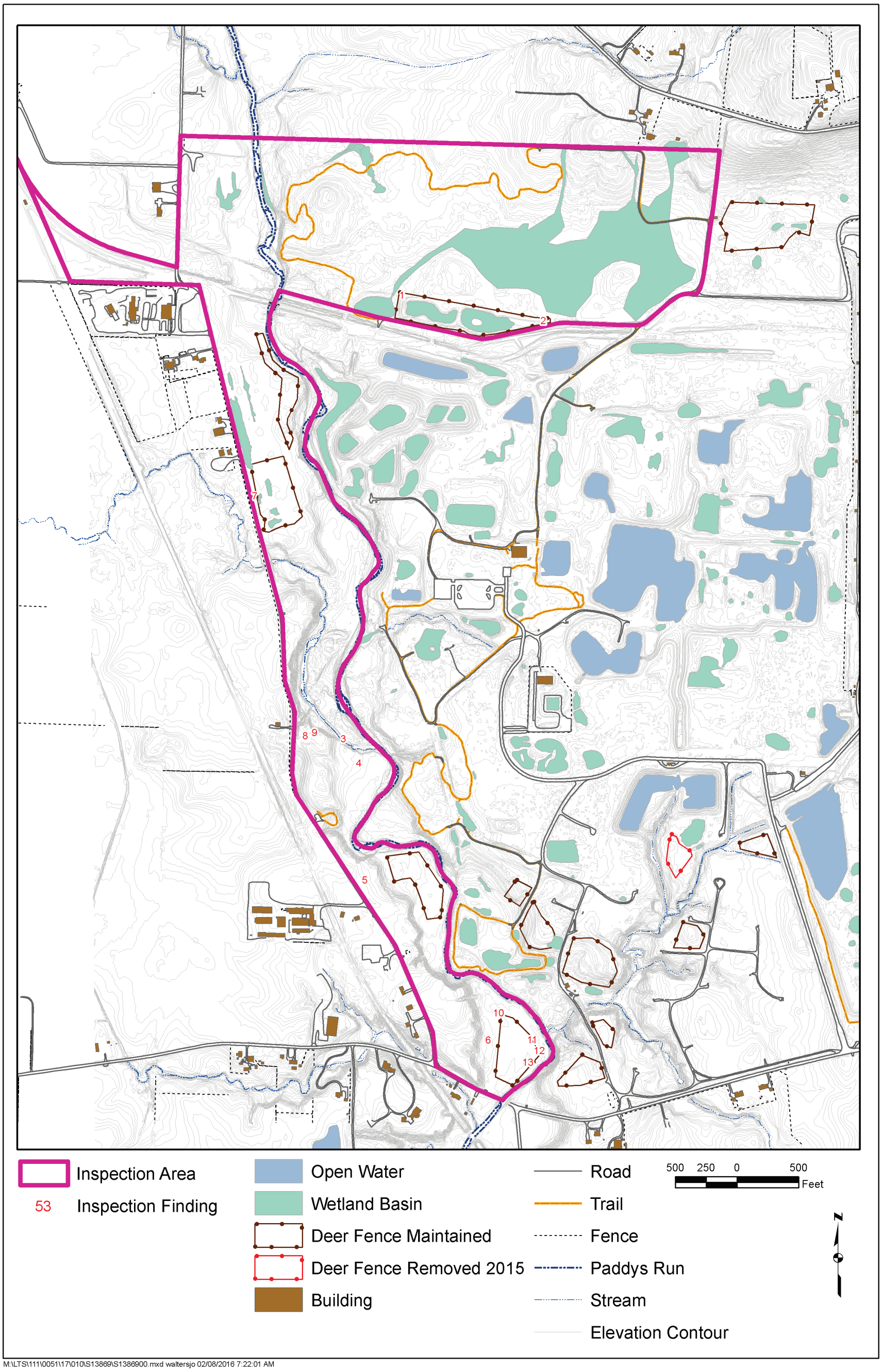

Figure D-4D. West Quadrant Site Inspection Findings, December 2015

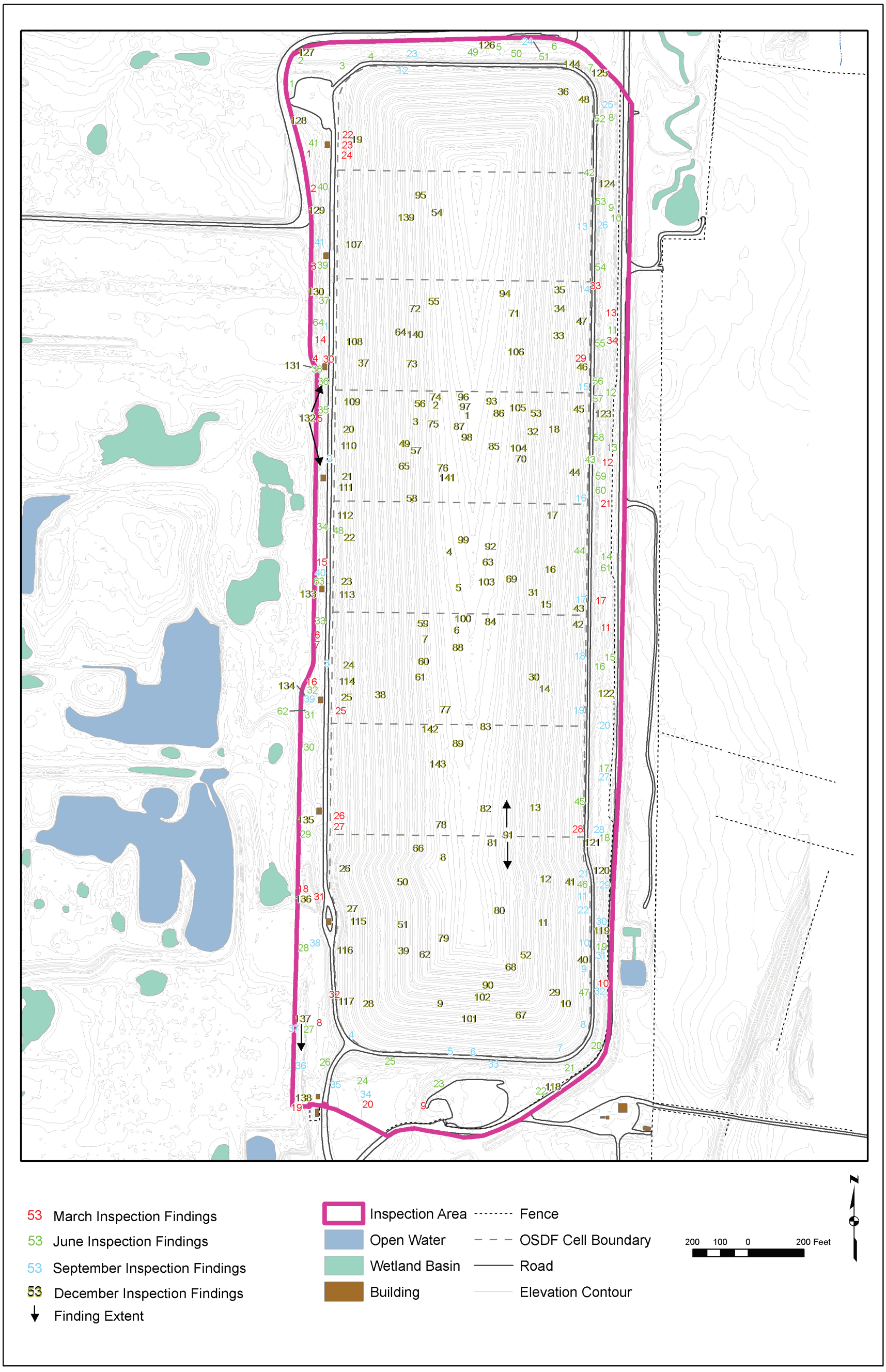

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Figure D-4E. 2015 OSDF Inspection Findings

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