Montes Creek Mitigation Site
As-Built Report

for

Mitigation Components

of the

Uinta Basin Replacement Project
Big Sand Wash Reservoir Project
(Corps of Engineers Action ID Number: 200250319)

Draft Off-Site Wetlands Mitigation and Monitoring Plan
Utah Reclamation Mitigation and Conservation Commission
(report dated 06/25/2007)

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August 2010

Table of Contents

List of Figures

List of Figures (continued)

List of Tables

Background

This document provides a summary of the activities that were planned and subsequently completed as mitigation for the Uinta Basin Replacement Project and Big Sand Wash Replacement Project (Corps of Engineers Action ID Number: 200250319), within the Montes Creek Wildlife Management Area (WMA). Annual performance and monitoring reports, for the Corps permit, are being prepared separately (currently in year 1 of 5). The original study of the area and the mitigation planning and design were completed by the consulting firm MWH, and reported in a document dated 6/25/2007. Construction was completed by Utah Division of Wildlife Resources (UDWR) crews, primarily in the winter months of 2008. Lining of wetlands with a topsoil mixture of sand and organic bio-solids was completed in the fall of that same year. Construction oversight was provided by Allred Restoration, Inc., and by Utah Reclamation Mitigation and Conservation Commission (URMCC) personnel.

Site Location and General Description

The Montes Creek WMA is located in Uintah County, Utah, in the NW ¼ of NE ¼ and SW ¼ of NE ¼ Section 6 T2S, R1E and SE ¼ of SW ¼ Section 31 T1S, R1E USGS Roosevelt 1:24,000 quadrangle (Figure 1 – from MWH report). The boundaries of the WMA, and the area that was studied as a potential mitigation site, are shown in Figure 2 (from MWH report).

The initial conditions of the site were documented in the report by MWH. The site had a substantial area that was inhabited by Russian olive trees: an invasive species that tends to dominate the landscape in areas where conditions are suitable. Patches of Russian olives were identified and slated for removal (Figure 3 – from MWH report). The WMA had a mixture of soil types, in upland areas and jurisdictional wetlands. The wetland delineation, wetland types, and soil types, are shown in Figures 4, 5, and 6, respectively (from MWH report).

A Review of the Selected Alternative and Intended Benefits

This section summarizes the selected alternative and the expected benefits of this mitigation project.

Several alternatives were considered during the design process, but “Alternative 3” was eventually selected as the best choice. This alternative proposed the implementation of a number of actions, including:

- Riparian wetland enhancement by Russian olive tree removal (see Figure 3)
- Wetland restoration by filling drainage ditches
- Wetland enhancement by controlling noxious and invasive weeds

- Develop new emergent wetlands by converting existing upland to emergent wetland

The development of new wetlands from upland areas was a central component of the selected alternative. The size and location of the designed wetlands is illustrated in Figure 7, and a cross-section view is shown in Figure 8 (both from MWH report).

The selected alternative was projected to enhance the following wetland functions/values:

- Dynamic water storage (by converting uplands to wetlands, enhancing riparian areas)
- Flood flow attenuation (by converting uplands to wetlands, enhancing riparian areas)
- Nutrient and pollutant removal (by converting uplands to wetlands, enhancing riparian areas)
- Sediment stabilization and retention (by converting uplands to wetlands, enhancing riparian areas)
- Groundwater recharge (by converting uplands to wetlands, enhancing riparian areas)
- Surface water interception (by converting uplands to wetlands, enhancing riparian areas)
- Erosion control (by converting uplands to wetlands)
- Wildlife habitat (by converting uplands to wetlands with increased habitat complexity, enhancing riparian areas)
- Wildlife watching (by converting uplands to wetlands, enhancing riparian areas)
- Recreational opportunities (by converting uplands to wetlands, enhancing riparian areas)

Completed Actions

The selected alternative has been fully implemented, with very few adjustments and/or changes. A post-project, 2009 aerial image shows all the major components, which are labeled in Figure 9, including; (1) removal of Russian olive trees, (2) excavation of several large new wetlands in an upland area, (3) plugging of drainage ditches, and (4) placement of spoil material along the northeast slope of the northern bluff.

Russian Olive Removal
Mitigation work commenced with Russian olive removal, which was essentially complete in roughly two weeks. Russian olive trees were removed from approximately 24 acres within wetland areas and from 4 acres in upland areas to satisfy palustrine forested and scrub shrub wetland mitigation requirements. Additionally, removing all the Russian olive trees from the wetlands and uplands in this portion of the Montes Creek WMA should reduce groundwater export via evapotranspiration and help control local Russian olive seed sources. The Russian olive trees were removed by: 1) excavation using a backhoe (trees were stockpiled and burned at a later date); 2) cutting the trunks as close to the ground as possible, immediately treating the

cut stumps with herbicide (Garlon-4); or 3) basal bark application of Garlon-4® to small stems. Figure 10 shows a portion of the WMA following Russian olive removal, with many large piles of trees that were subsequently burned.

Excavation of New Wetlands in Upland Areas

Excavation of the new wetlands began early in February of 2008, soon after removal of the Russian olive trees (see Figure 10). Temporary access roads were cleared of snow to allow the ground to freeze. The frozen ground allowed equipment to move freely around the site without sinking into the soil, although caution still was required when working in particularly wet areas. Wetland excavation proceeded rapidly, with the bulk of the earth moving completed by March, 2008 (Figure 11).

Spoil from the excavation of the large wetlands was dumped along the northeast margin of the northern bluff, and was subsequently contoured and seeded to promote growth of native upland vegetation. This location is very dry and revegetation success to date has been limited. Some follow up work may be needed to get desirable vegetation established on the new slope.

The soils around the constructed wetlands were quite sterile and needed some type of soil amendment to promote a healthy and viable wetland plant community. After excavating the land surface between the wetland ponds to the desired elevation, the soil was stripped an additional six inches and replaced with a comparable thickness of on-site excavated/recovered sand, amended with compost (Figure 12). Compost used for the project was Class A municipal waste compost from the Ashley Valley Sewer Management Board wastewater treatment plant located in Vernal, Utah. This topsoil mixture now provides a good growth medium for wetland plants.

In some locations, the topsoil mixture appears to have been applied with bio-solids that were not completely cured. These composted waste products require a curing period to allow for complete breakdown of the waste material. Although most of the material appeared to be completely cured, there were some problem areas where the curing process was apparently not complete. These locations are referred to as “hot” areas, and they appear as black slicks with little or no plant growth. One of these hot areas is shown in Figure 13. The hot areas cover only a small proportion of the wetland area, and as such, are deemed to be a minor problem. Over time, the organics in the hot areas should break down and allow vegetation to grow normally.

Recent photos of the constructed wetlands are shown in Figures 14, and 15. Water for the wetlands comes primarily from groundwater in the spring, but later in the year water is delivered via an irrigation valve that is located north of the wetlands (Figure 16). This valve can be opened, as needed, to provide additional water for the wetlands.

Water quality appears to change dramatically from the north to south, through the constructed wetlands. In the northern ponds, near the inflow, the water is relatively clear, with substantial amounts of floating algae present in the open-water areas. However, the southern wetlands, which are farther from the water source, appear to have a very different water quality. In these wetlands, the water is very green and turbid (Figure 17), with little floating vegetation. The likely reason for the apparent change in water quality is nutrient enrichment from the bio-solids, which should disappear over time as the nutrients are taken up by plants and bound to sediments.

Plugging of Drainage Ditches

Wetland drainage ditches were excavated on the property by previous land owners, apparently with the objectives of improving livestock grazing by removing standing water and lowering the water table on a portion of the wet meadow wetland. These objectives are contrary to the goals of this mitigation project. As such, the ditches were plugged in a number of places (see Figure 9), to prevent drainage and lowering of the water table, and to promote additional wetland habitat. Ponded water is present upstream of each plug (Figure 18), which creates a mosaic of wetland habitats that are supporting a diverse population of biota.

Revegetation

Constructed features, topsoil storage sites, spoil disposal sites and all other areas disturbed during construction were revegetated with native, local plant materials. In the fall of 2008, all areas disturbed by construction were seeded with one of two native seed blends, described in Tables 1 and 2.

Table 1. Wet Meadow Seed Blend

COMMON NAME	SCIENTIFIC NAME
Beaked sedge	*Carex rostrata*
Nebraska sedge	*Carex nebrascensis*
Nuttal's alkali grass	*Puccinellia nuttalliana*
Hardstem bulrush	*Scirpus acutus*
Blackcreeper sedge	*Carex praegracilis*
Desert saltgrass	*Distichlis stricta var interior*
Alkali saccaton	*Sporobolus aeroides*
Slender wheatgrass	*Elymus trachycaulus*

Table 2. Riparian Seed Blend

COMMON NAME	SCIENTIFIC NAME
Bluebunch wheatgrass	*Pseudoroegneria spicata* (*Agropyron spicatum*)
Canby bluegrass	*Poa canbyi*
Western wheatgrass	*Pascopyrum smithii* (*Agropyron smithii*)
Squirreltail	*Elymus elymoides*
Great Basin wildrye	*Elymus cinereus*
Lewis flax	*Linum perenne lewisii*
Yarrow	*Achillea millefolium*

After seeding of disturbed areas was complete, additional vegetation was installed, including trees, shrubs, and herbaceous plugs. These plants were installed in the spring of 2009, in the approximate numbers listed in Table 3.

Table 3. Plant Materials (Bareroot Seedlings, Rooted Cuttings, Plugs or Container Grown Plants) Installed at the Montes Creek Mitigation Project.

COMMON NAME	SCIENTIFIC NAME	NUMBER PLANTED SPRING 2009
Boxelder	*Acer negundo*	500
Cottonwood	*Populus angustifolia*	1000
Silver buffaloberry	*Shepherdia argentea*	500
Duchesne hawthorne	*Cratageous douglasii*[1]	500
Coyote willow	*Salix exigua*	1000
Oakleaf sumac	*Rhus trilobata*	250
Wood's Rose	*Rosa woodsii*	750
Beaked sedge	*Carex rostrata*	500
Nebraska sedge	*Carex nebrascensis*	500
Baltic rush	*Juncus arcticus*	500

Summary

All major planned elements of the project were completed by the spring of 2009. Since that time, the UDWR has managed the property and the wetlands have responded with rapid growth of many wetland species. The wetlands appear to be providing valuable habitat that is being used by the local biota. The planned benefits of the project appear to be realized.

Invasive weeds are still a minor problem, especially early colonizing species, but weed control is planned for the future to keep the extent of weeds under control. As mature wetland vegetation continues to develop, weeds should become a less pressing issue. However, Russian olive control will need to continue for many years, until the seed bank is depleted. Some control of Russian olive will likely be required in perpetuity.

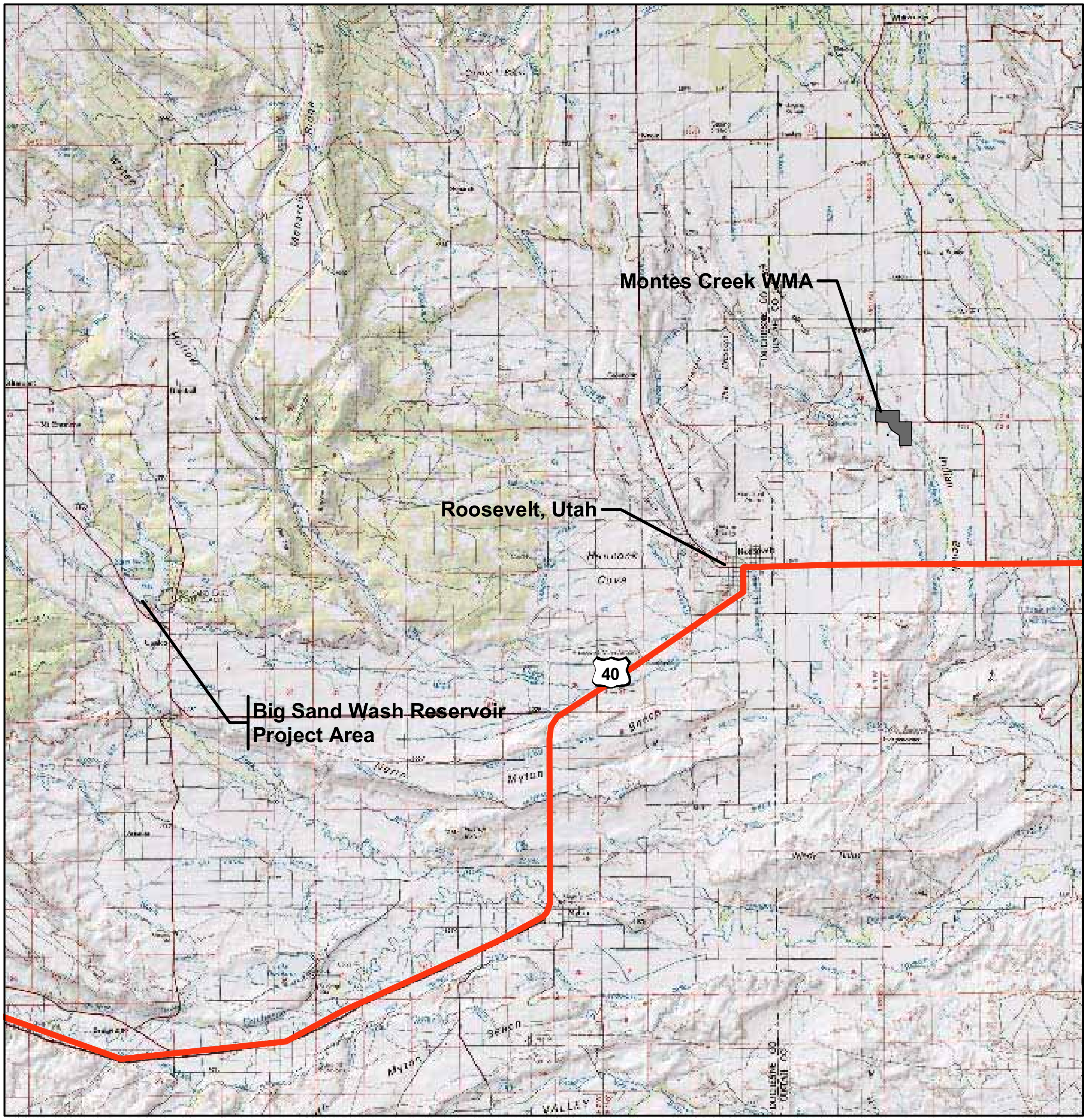
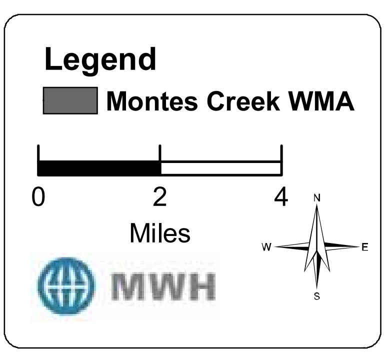
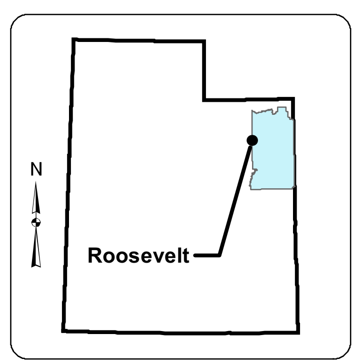


Figure 1
Big Sand Wash Reservoir
and Montes Creek WMA Location Map





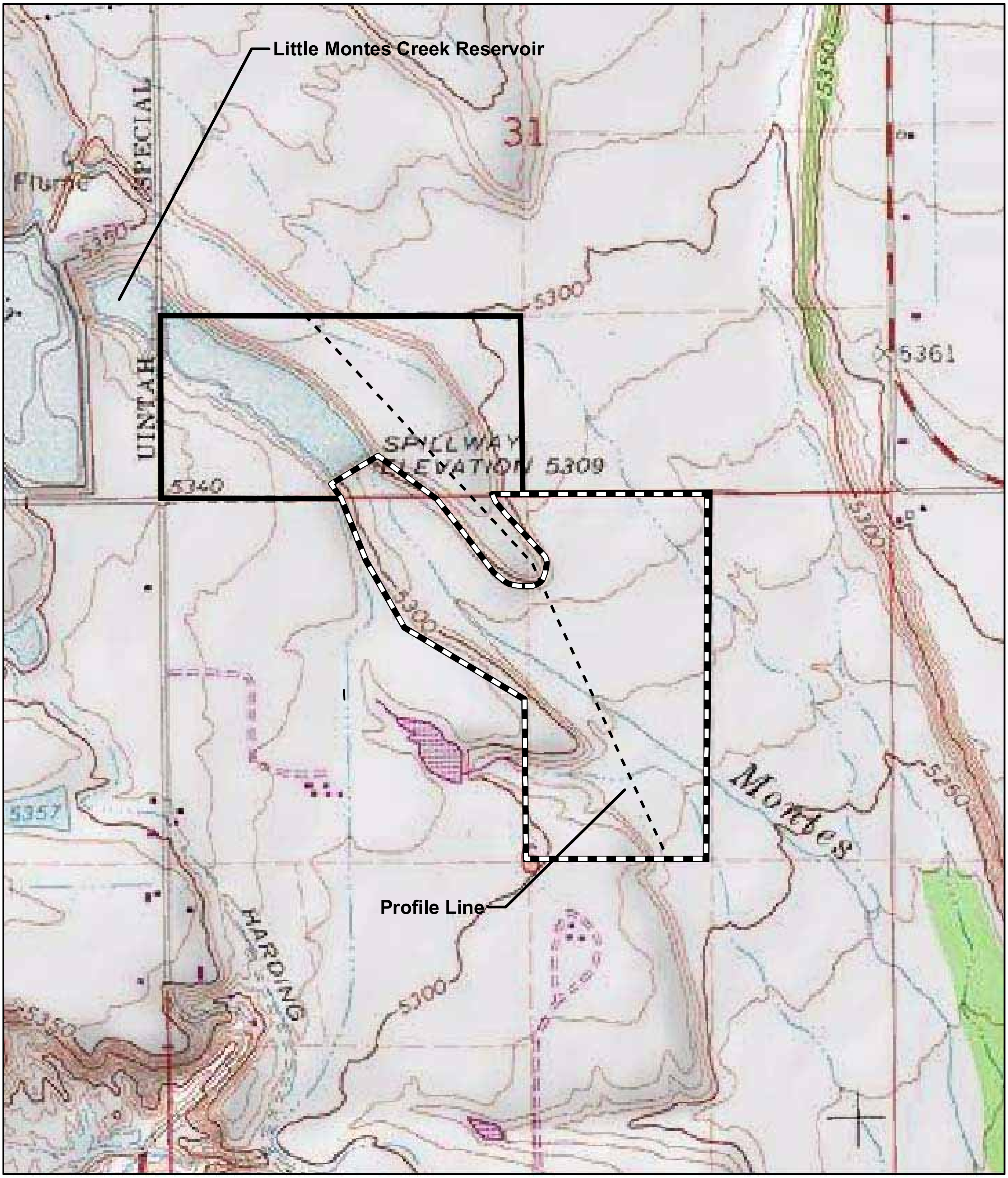
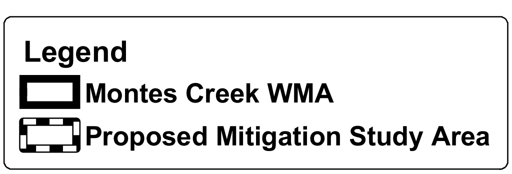
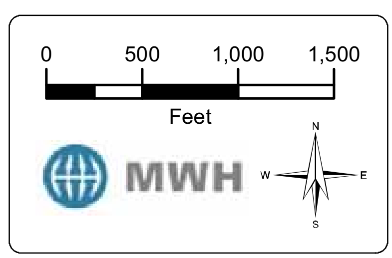
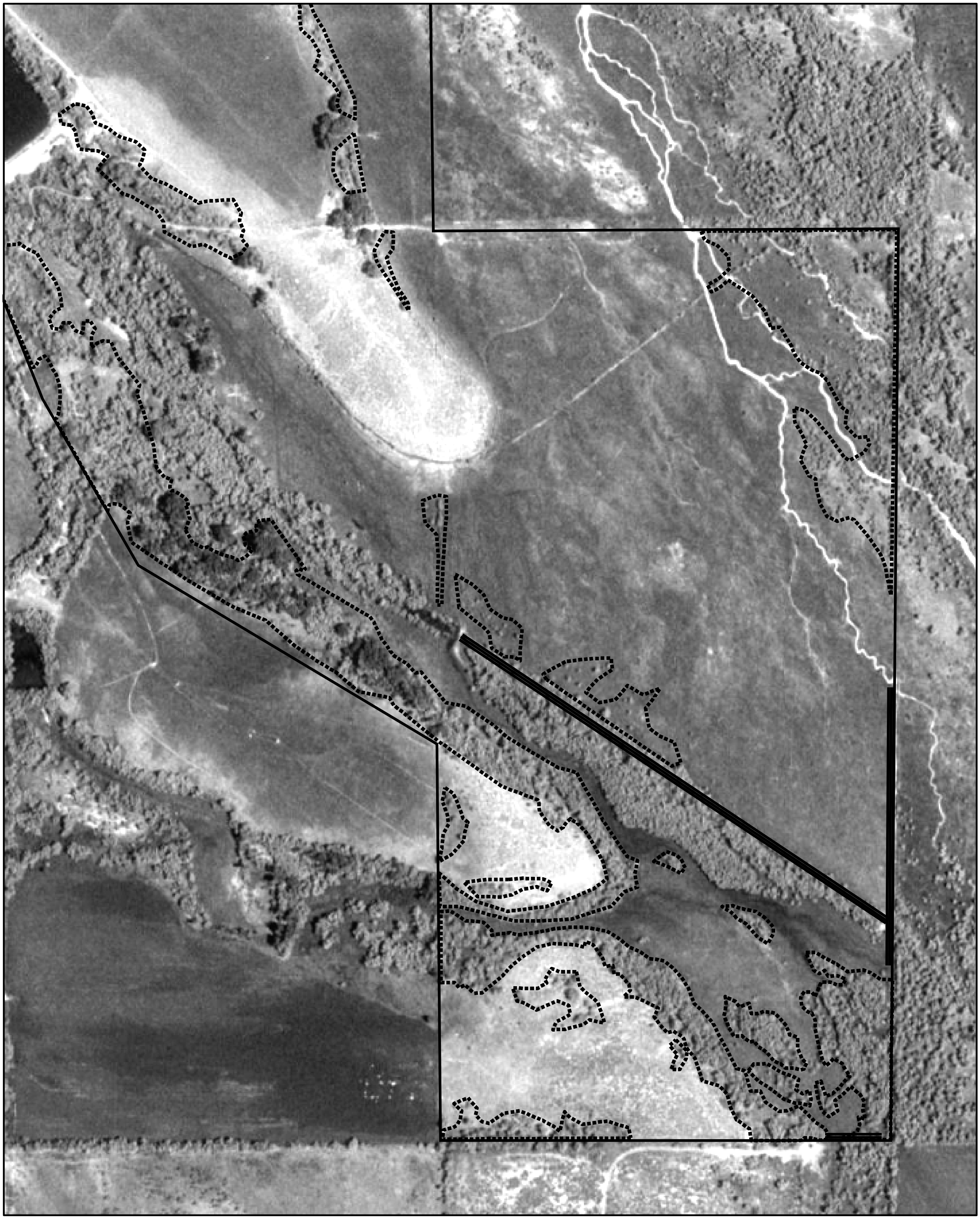


Figure 2
Montes Creek WMA Site Map







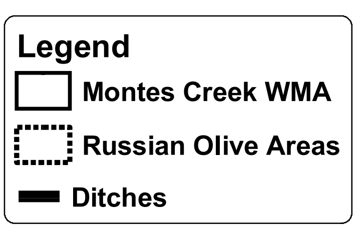
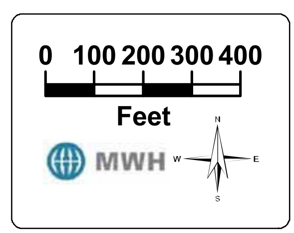


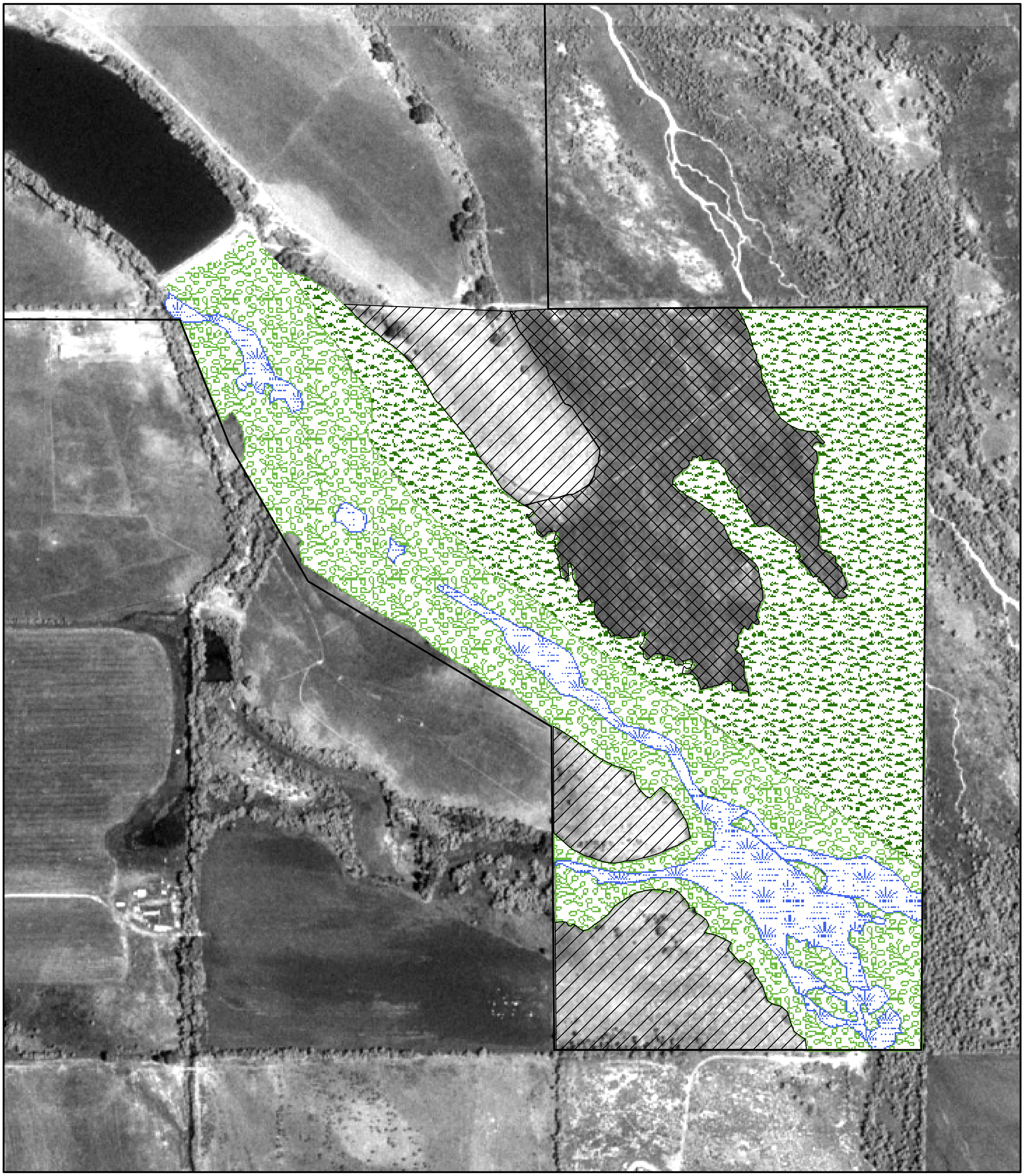
Figure 3
Russian Olive Tree Removal Areas and Ditches Proposed to be Back-Filled



Legend
Wetland Delineation Line
Soil Test Pits
Montes Creek WMA
Upland Areas

Figure 4
Montes Creek WMA Wetland Delineation

0 100 200 300 400
Feet
MWH



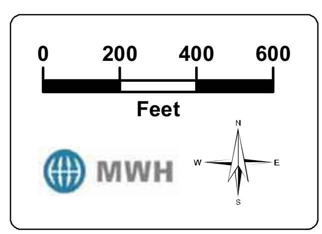
Legend

- Montes Creek WMA
- Forested = 30.7 ac.
- Emergent = 9.3 ac.
- Wet Meadow = 32.7 ac.

Upland Areas

- Upland Bluff
- Potential Mitigation Area

Figure 5
Montes Creek WMA Wetland Types and Upland Areas



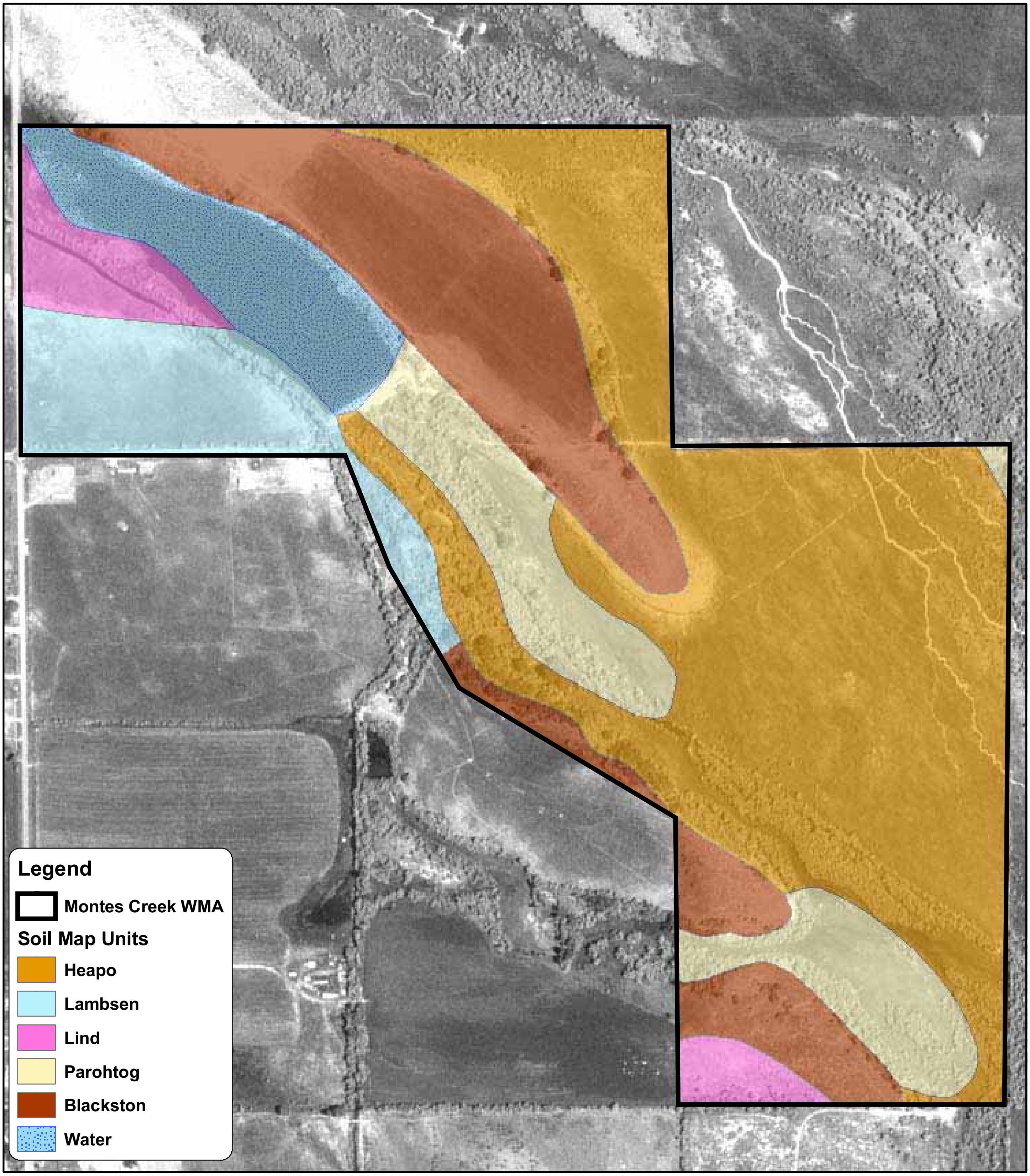
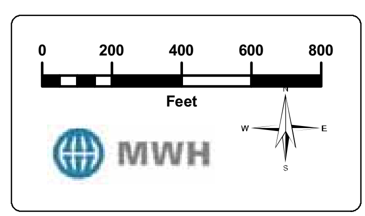
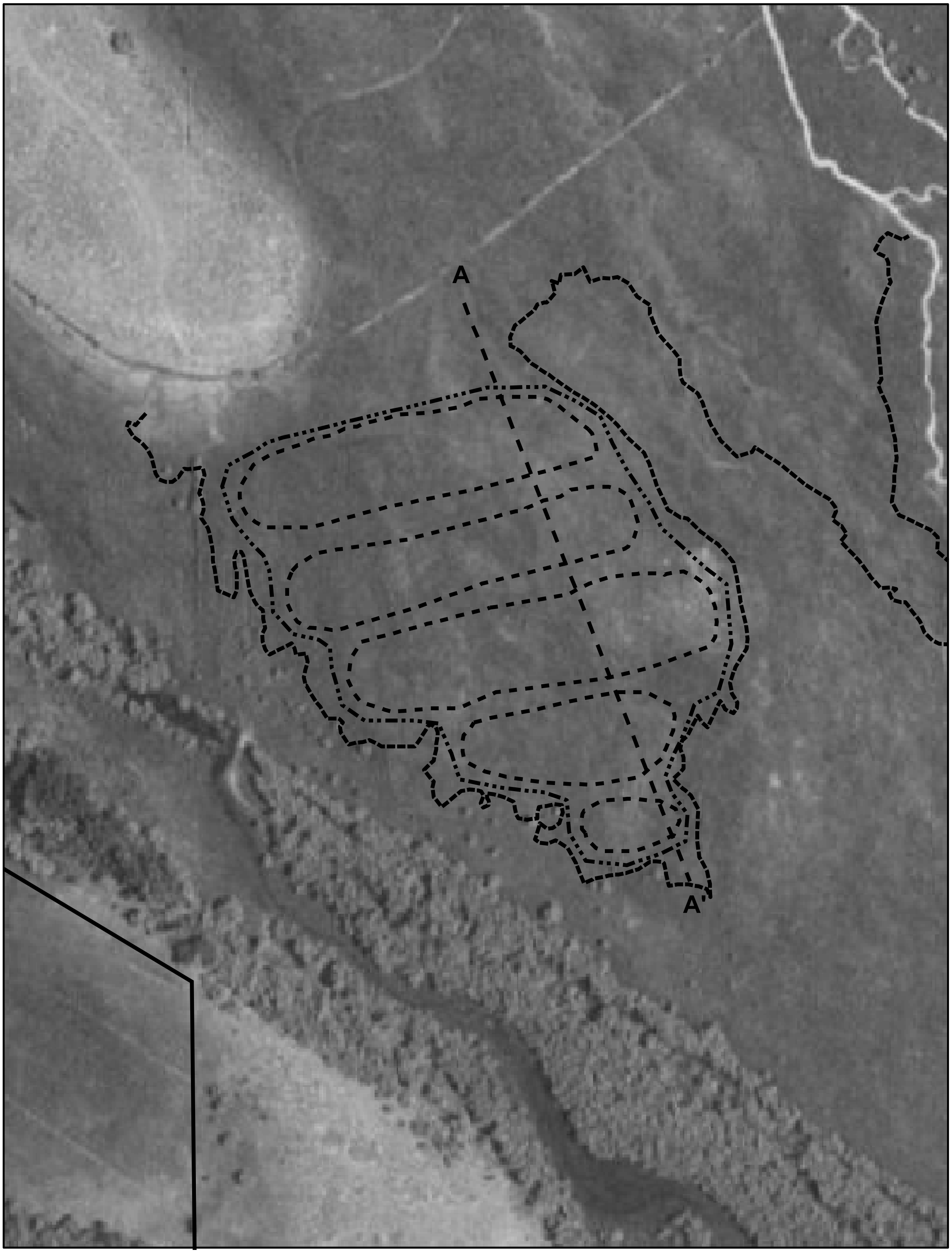


Figure 6
Montes Creek WMA Soils Map





Legend

Excavated Pools

Limit of Excavation

Pool

Profile Line

Wetland Delineation Line

Montes Creek WMA

Figure 7
Alternative 3 Plan View

0 100 200 300
Feet

MWH

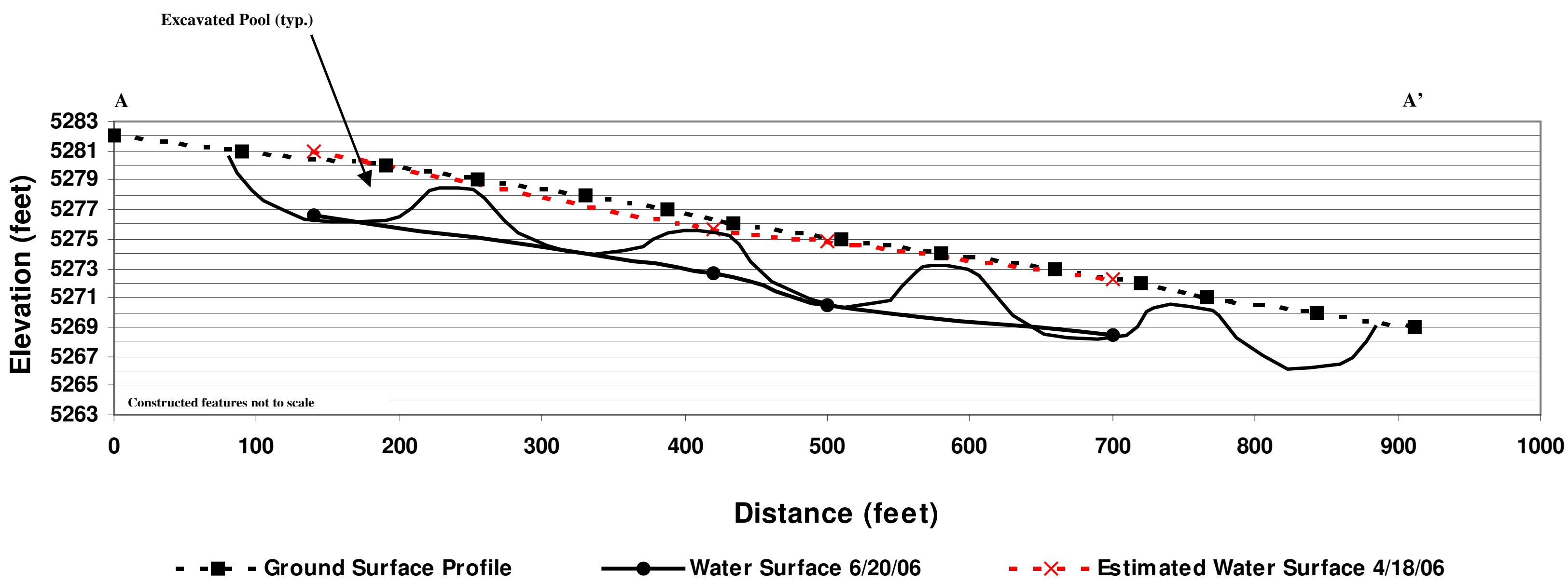


Figure 8
Alternative 3 Profile View

Figure 9. Aerial image of the mitigation site at the Montes Creek WMA, taken in 2009. The image shows several several of the main features that were constructed for the mitigation project.

Figure 10. Photograph of the mitigation site following removal of Russian Olive trees. The trees have been uprooted and placed into piles for subsequent burning. This image also shows the beginning of wetland excavation.

Figure 11. Photograph of the mitigation site taken in March 2008. The bulk of earth movement was mostly completed, but contouring, shaping, and topsoil application were still needed.

Figure 12. Photograph of the newly-constructed wetlands after application of the topsoil mixture.

Figure 13. Photograph of the mitigation site taken in 2010. The topsoil mixture had "hot" areas where breakdown of organic material was incomplete. The areas are visible in the photo as dark patches. Little vegetation has grown in those locations.

Figure 14. Photograph of the mitigation site at the Montes Creek WMA, taken in summer of 2010. The large wetlands have revegetated well with a mixture of wetland vegetation, and some weedy species as well. Water for the project gushes up from a valve, and can be seen at center left in the photo.

Figure 15. Photograph of the mitigation site at the Montes Creek WMA, taken in summer of 2010, showing a variety of plants that have established following construction.

Figure 16. Photograph of the mitigation site at the Montes Creek WMA, taken in summer of 2010. This view shows the valve that provides irrigation water to the wetland cells, which are visible in the distance.

Figure 17. Photograph of the mitigation site at the Montes Creek WMA, taken in summer of 2010. This view shows the green water that is present in the two southern-most wetland cells. The northern bluff is visible in the distance.

Figure 18. Photograph of a new wetland that was created by plugging a large drainage ditch. The ditch was plugged in several locations; each plug creating a small backwater wetland similar to the one shown here.