



Lake Red Rock Project
MASTER PLAN

CHAPTER 3

Management Goals & Resource Objectives

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- 3.1. Introduction
- 3.2 Focus Areas
 - Sustainable Environment
 - A Natural Place to Play
 - Connections



3.1. INTRODUCTION

The Corps' vision for the future management of the land, water and recreational resources of the Lake Red Rock will be managed to protect, conserve, and sustain natural and cultural resources, especially environmentally-sensitive areas, and provide quality outdoor recreation opportunities that complement project resources for the benefit of present and future generations.

This vision is supported by the broad management goals listed on the next page. This chapter sets forth specific goals for environmental stewardship and recreation



3.2. The following goals and objectives were identified by focus groups during the Red Rock master planning process. They are broken into three Primary Focus Areas: *Sustainable Environment*, *A Natural Place to Play*, and *Connections*. Each of the Focus Areas and associated goals will be discussed in the following sections.

Sustainable Environment

- Protect threatened landscapes
- Restore Environmentally Sensitive Areas (ESAs) to pre-settlement landscapes
- Eliminate invasive species within ESAs & other Important Natural Resource Areas
- Improve Fisheries
- Maintain 95% of current public hunting acreage. The total hunting acreage currently at the Lake Red Rock Project is 44,507.

A Natural Place to Play

- Maintain & expand existing water based recreation opportunities to meet public desire within carrying capacity
- Develop low impact, active resource based recreation opportunities
- Develop unique recreation opportunities that encourage respectful connection to the Environment

Connections

- Reduce habitat fragmentation
- Develop trail connections to area communities
- Develop effective wayfinding
- Create interpretive opportunities that connect people to the environment & encourage play in nature
- Protect/enhance access to public lands



Sustainable Environment

- Protect threatened landscapes
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- Maintain 95% of current public hunting acreage. The total hunting acreage currently at the Lake Red Rock Project is 44,507.



Sustainable Environment

Red Rock has the largest contiguous public land base in the state of Iowa at approximately 38,000 Acres and an additional 15,250 acres of water, creating the largest lake in Iowa.

Public land is at a premium in the State of Iowa. The goals established under the focus area Sustainable Environment are listed below. These goals will guide and ensure the public land that the Corp of Engineers manages around Lake Red Rock continues to serve as an important part of the Nation's natural resource, available for all to experience and enjoy.

Goals:

- Protect threatened landscapes
- Restore Environmentally Sensitive Areas (ESAs) to pre-settlement landscapes.
- Eliminate invasive species within ESAs & other Important Environmental Units
- Improve Fisheries
- Maintain 95% of current public hunting acreage. The total hunting acreage currently at the Lake Red Rock Project is 44,507.



Environmentally Sensitive Areas - Vision

Goals:

- **Protect threatened landscapes**
- **Restore ESAs to pre-settlement landscapes**

The vision of environmental stewardship at Lake Red Rock is to protect depositories of biodiversity. The role of the Corps of Engineers in Iowa is critical to the conservation of a multitude of high value flora and fauna. There is a thin ribbon of land around Lake Red Rock that includes areas dedicated to flood risk management, recreation and environmental stewardship. Land allocated for resource protection is becoming a rare commodity in a state where row crop agriculture is the dominant land use. Some of the geographic areas at Red Rock has been classified as ESAs. An ESA is defined as land where scientific, ecological, cultural or aesthetic features have been identified. Such sites may have known locations for threatened or endangered species; critical habitats for priority species; high quality native plant communities; have a landscape history indicating a serious lack of disturbance; scenic or iconic landscape.

Development in ESAs will not be allowed except for the concepts that have been included in this Master Plan and in extremely rare circumstances, such as; utility, trail, and road right-of-way expansions in existing corridors. Public access to ESAs will be provided as appropriate; however, these high priority landscapes will be protected from detriment. No activity will be allowed that would reduce the area to something less than an ESA. In the extremely rare circumstance (i.e. utility, trail, or road right-of-way expansions) that an impact to an ESA is unavoidable, mitigation for the loss of the resource will be required. All new utility corridor easements will require underground placement of all utility lines. No above ground utility lines will be authorized.

During the master planning process, meetings were held with other agency personnel to invite their participation in the identification of ESAs at Lake Red Rock. These include Marion County Conservation Board, the Iowa Department of Natural Resources, and the Fish and Wildlife Service. There was also participation from various environmental and conservation user groups. These included Pheasants Forever, Wild Turkey Federation, Iowa Ornithologist Union and anglers, to name a few. A goal of the process was to identify places at Lake Red Rock that participants thought should be classified as ESAs. Participants marked the proposed locations on maps.

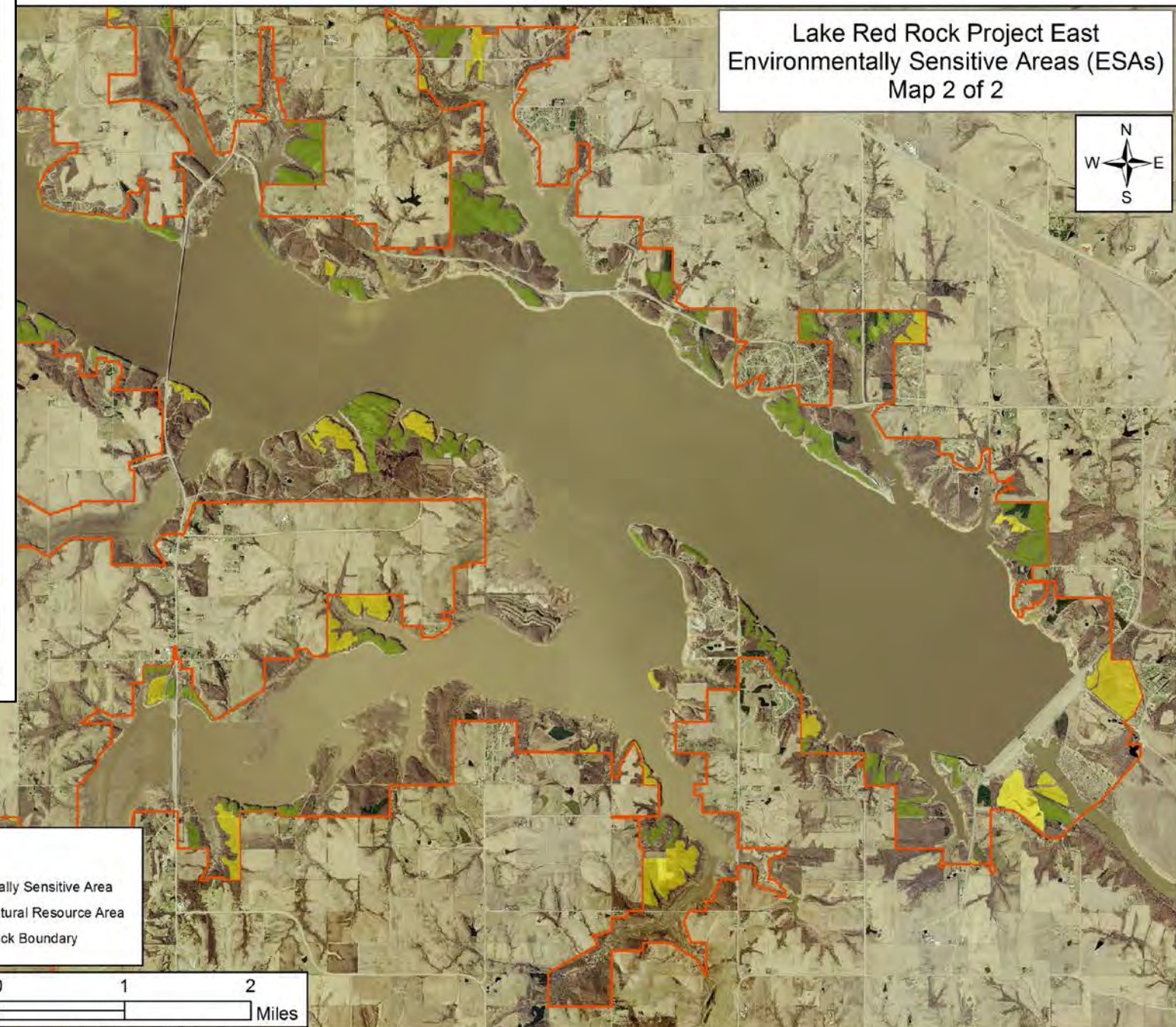
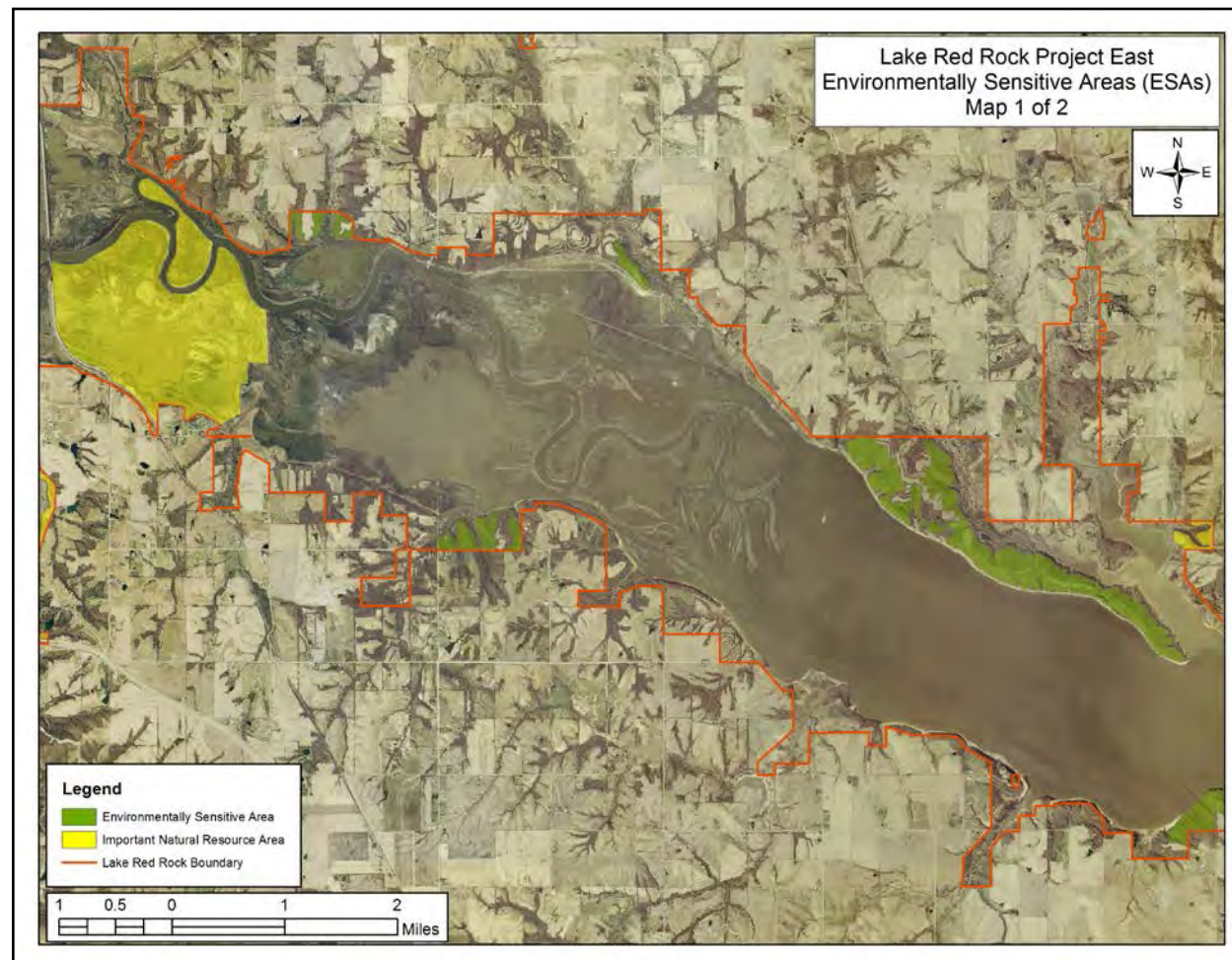
An analysis of the proposed ESAs and 42 management units was conducted. The analysis included a review of the following criteria: historical and scenic features; geographical and geological features; site potential; access to site; historical vegetation; land use; inventory notes; known special concern species and other considerations. Any land below full flood pool (780) was considered ineligible.

When the attributes were documented the analysis was completed by placing the area in one of three categories: Environmentally Sensitive Area, Important Natural Resource Area, and Ineligible. Some management units had no qualifying features to be classified as an ESA.





Environmentally Sensitive Areas and Other Important Natural Resource Areas



Environmentally Sensitive Areas (ESA) (areas shown in green) are areas where scientific, ecological, cultural, geological or aesthetic features have been identified.

Other Important Natural Resource Areas (areas shown in yellow) are sites that were recommended by others to be classified as ESAs. During the ESA analysis, the Important Natural Resource Area sites were determined to lack enough qualification to be an ESA, yet they had significant natural qualities and characteristics that warranted distinction. These other Important Natural Resource Areas are sites that form a second tier of consideration for managers, and when combined with adjacency to an ESA, increases the value of both by reducing effects of fragmentation.



The vision of environmental stewardship at Lake Red Rock is to protect depositories of biodiversity, which is crucial in Iowa because the state is becoming legion with the number of species of flora and fauna needing strong measures of conservation.

RESEARCH

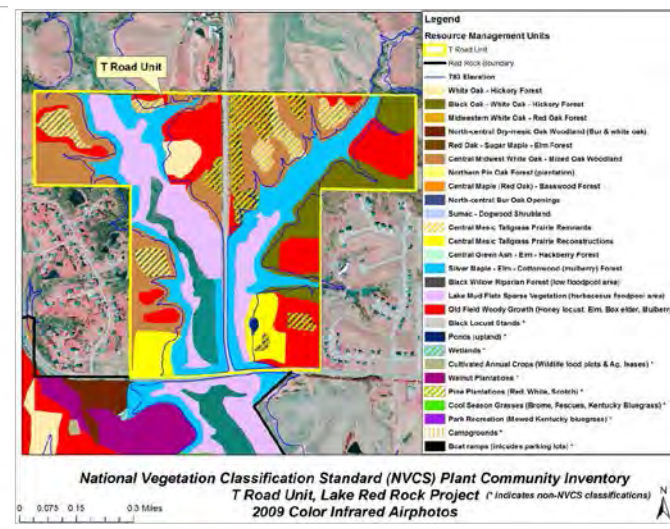
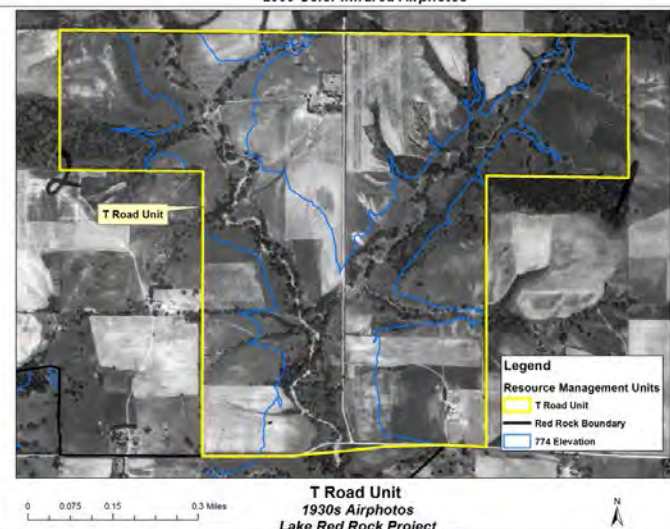
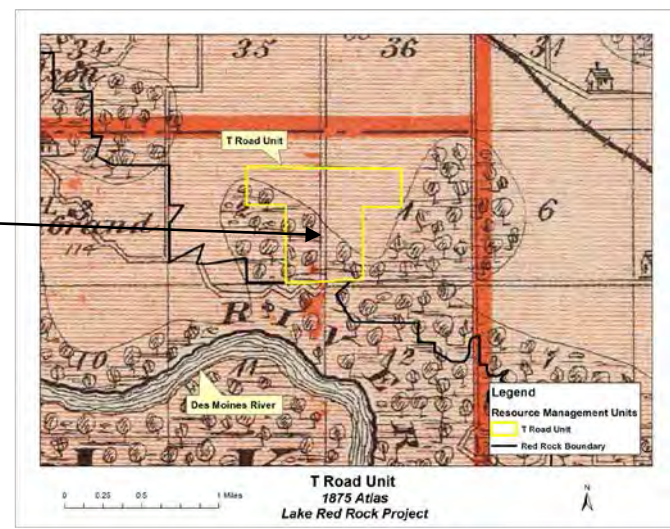
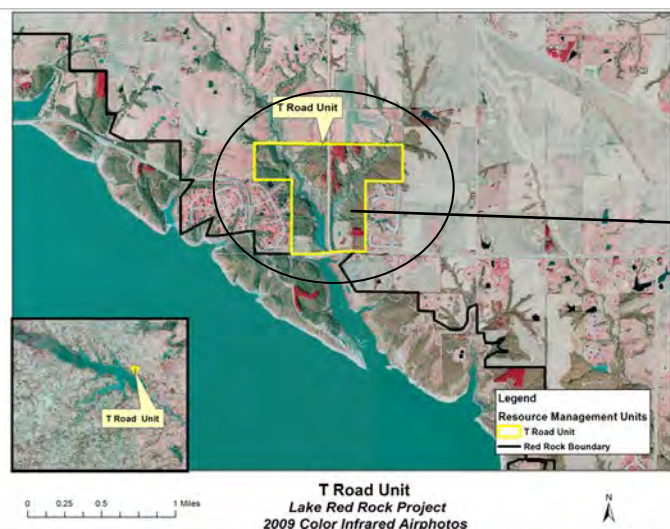


MAPPING

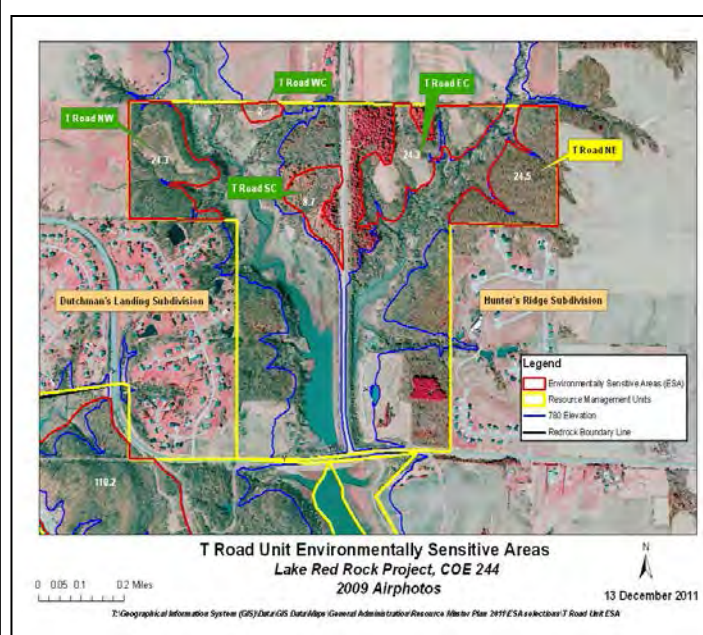


PLANNING

Each ESA was reviewed using aerial photography, vegetation classifications, field site visits, etc. T road unit is shown below as an example of the information used to research the area.



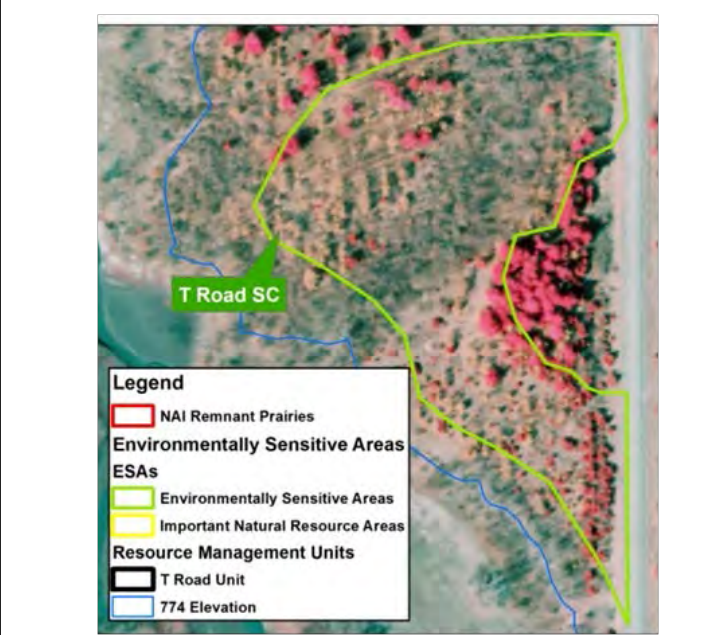
Maps were developed to identify ESAs and adjacent lands. Individual ESA maps were created and areas were researched more closely.

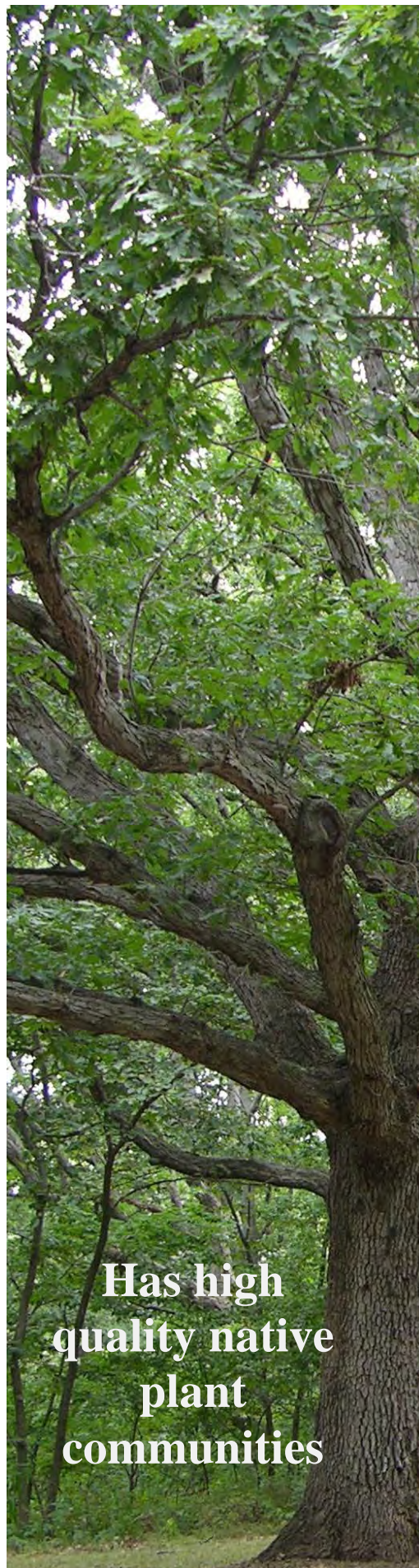


Stewardship Plans were created for the area identifying important species; desired landscapes; adjacent habitats and acres.

Example:

T Road SC ESA: A threatened species (Slender Ladies'-tresses) and two special concern species (broomsedge bluestem and Great Plains Ladies'-tresses) recorded in remnant prairie area, potential for a remnant prairie expansion, future oak savanna potential, and quality oak plantation. 8.7 Acres.





Has high
quality native
plant
communities



Demonstrates
lack of serious
disturbance



Has important
habitat for
priority species

May have
known
archaeological,
historical,
geological or
cultural site(s)



Known location or have
potential for state- or
federally-listed
species



Scenic or
iconic
landscapes

CHAPTER 3
Sustainable Environment



The following are synopses of the ESAs at the Lake Red Rock Project along with the intended outcome for each area between 2015 and 2040. For more information regarding the qualifying features of these sites please see the individual ESA analysis.

1. T Road Unit (315.3 acres; 191.2 acres above 774 elevation). This unit is comprised of 315.3 acres and has four qualified ESAs and one important resource management area. The ESAs are separated by deeply dissected unnamed tributaries and 180th Avenue. Two re-established prairies were planted at former borrow sites for elevated road construction. The southwest re-establishment became a fill site for excavated sediments from Marina bay. The ESAs are degraded prairies and wooded tracts that have great potential to become high quality remnant prairie-savannas. This should be achieved by expanding the prairie areas, removing shade tolerant and exotic species. Combining existing disjunctive units together by selective removal of unwanted vegetation and treating future management strategies for larger tracts is needed. Removal of all pine plantations should be performed during the effective range of the master plan. The majority of the unit is surrounded by either agriculture (row crops and pasture) or subdivisions.

T Road NW ESA (24.3 acres) A degraded prairie remnant and oak savanna surrounded by oak/hickory woodland with high potential for oak savanna restoration and remnant prairie expansion. A state threatened prairie species *Spiranthes lacera*, was recorded on the site in 1993. The site has native and exotic species encroaching throughout. Management strategies should be continued to reclaim and restore this valuable remnant. The undisturbed woodland around the prairie should be cleared of shade tolerant and invasive species to increase the size of the restoration site. Restoration goals for the prairie should focus on maintaining species diversity and impeding woody encroachment. Restoration goals in degraded savanna surrounding the hillside prairie should return the appearance and ecological function of the area's presettlement condition. Frequent controlled burns conducted in November should minimize potential damage to spring wildflowers, while encouraging the growth of herbaceous savanna understory species adapted to an ecosystem of partial shade and dappled sunlight. The site should be restored to its fullest potential as a prairie savanna.

T Road WC ESA (2.0 acres) A small degraded prairie remnant with high quality plant species present: rough blazing star, slender ladies tresses, little bluestem, broomsedge bluestem. Substantial work has been conducted in reducing woody species encroachment in the prairie area since 1996. The area has a small infestation of *Sericea lespedeza* and some woody species remain, but there is great potential for prairie expansion. Management strategies should be continued to reclaim and restore this valuable remnant. The forested area around the prairie should be cleared of shade tolerant and invasive species to increase the size of the restoration site. Southern portions of area were planted to trees in 1980. Any remaining maple and pines trees should be removed, as these species are not native to southern Iowa upland forests. A more frequent controlled burn schedule of varying fall and spring fire should help control invading woody species. Restoration goals for the prairie and surrounding woodland should strive to return the area to native plant

communities of open white oak woodland, bur oak savanna and tallgrass prairie.

T Road SC ESA (8.7 acres) A degraded remnant prairie area and quality oak plantation with potential for prairie expansion. A threatened species, Slender Ladies'-tresses, and two special concern species, broom sedge bluestem, and Great Plains Ladies'-tresses, have been recorded. Substantial work has been conducted in reducing woody growth (non-oak) in the white oak plantation area since 1996. The area has small infestation of *Sericea lespedeza*, but currently invasive woody growth is minimal. Restoration goals for the prairie and surrounding woodland should strive to return the area to native plant communities of open white oak woodland and tallgrass prairie. The planted white oaks will provide the structural component of savanna/woodland restoration, but the herbaceous understory plants may prove more difficult to return to the site. Frequent fire will promote growth of any native savanna species that may still be present in the seed bank.

T Road EC ESA (24.5 acres) A degraded remnant prairie area with potential for expansion. Oak woodland partially surrounds area on steeper slopes and creek drainages. A threatened species, slender ladies' tresses, and two special concern species broomsedge bluestem, and smooth green snake, have been recorded in the remnant areas. Substantial work has been conducted in reducing woody growth with controlled burns and mowing in the prairie areas since 1987. The area has small infestation of *Sericea lespedeza*. Management strategies should be continued to improve this valuable remnant. The forested area around the prairie should be cleared of shade tolerant and invasive species to increase the size of the restoration site. Restoration goals for the prairies and surrounding woodlands should be to enhance the appearance and species composition found in the presettlement Iowa landscape.

2. Brush Creek Valley Unit (413.7 acres; 278.8 above 774 elevation). The Brush Creek Unit is so named by the creek drainage that bisects the western two thirds of the unit. The eastern one third of the unit is separated from the remainder by state highway 14. It, too, is bisected by creek drainage. The unit is also dissected by Dubuque Street and Erbe Street, in addition to high flood pool potential. This creates several isolated tracts, making management difficult in some areas, and easy access in others. The western portion has one qualified ESA: Northeast Brush Creek ESA and one important resource area, and one area considered but unqualified to be an ESA. There is an agricultural lease in the western portion within the flood pool. The eastern leg includes one qualified ESA: East Brush Creek. The physical barriers of the creeks, roadways and project boundaries necessarily limit the extent of management. Both ESAs exhibit potential high quality prairie-savanna attributes and strategies toward that end should be employed. A prairie remnant is located on private land northwest of the unit boundary.

NE Brush Creek ESA (8.0 acres) A degraded prairie remnant and oak savanna that has a state threatened plant species slender ladies' tresses and two special concern plant species recorded: great plains ladies'-tresses and eared foxglove. The site has native and exotic woody encroachments, due in large part by being planted to trees in 1983 and natural succession. About 125 native prairie species have been recorded at the site. Removal of woody plants has been pursued since the mid 1990's, along with occasional burning. The site should be restored to its fullest potential as a prairie savanna.



East Brush Creek ESA (75.7 acres) This ESA is a relatively large area lacking significant disturbance. It has large savanna structured bur oaks and hickories with shade tolerant woody succession occurring throughout. Very little management activity has been accomplished in this ESA. The area has excellent potential for oak savanna restoration, which should be the result of subsequent resource prescriptions. Access to the site is limited, however.

3. Fifield Unit (271.0 acres; 160.5 above 774 elevation (excluding recreation areas))

The Fifield Unit is named after the town of Fifield that was located below the unit's banks in the lake flood pool. The unit has several picnicking/day use areas. Highway G28 dissects the unit, as well as the Volksweg Trail. This provides excellent access to most of the unit, but heavy public use of the area can make management difficult during peak use times. Marion County Conservation Board manages the northwest portions of the unit, which includes a pine plantation. The unit is adjacent to Dutchman's Landing subdivision to the east, row crop, pasture and hayfields along the northern perimeters. The north one-half of the unit was recorded forest, and the south one-half was recorded as prairie. The south portion of the unit currently has very large, savanna structured white and bur oaks, indicating the prairie likely had scattered oak trees representing a savanna/prairie ecosystem.

S Fifield ESA (25.9 acres) This ESA is comprised of three tracts in very close proximity to each other, separated only by developed day-use recreation facilities. The ESA and adjacent excluded recreation areas have large savanna structured oaks that was recorded in GLO notes and 1875 atlas as prairie. The area does not appear to have a cropping history, therefore a good potential for prairie-savanna restoration in un-maintained areas. Natural succession has permitted a proliferation of shade tolerant species to dominate the area, and also cause shade pruning of the savanna oaks. These areas also have scenic vistas of the lake and Des Moines River valley.

NE Fifield ESA (7.7 acres) This area has a non-crop history except for the eastern edge, and had dominant species composition of oak, hickory and honey locust. The honey locust abundance implies a pasturing history, and the understory is now a mixture of native and exotic shade tolerant invasive exotics. Prescriptions to eliminate the shade tolerant invasives and restore a prairie-savanna environment should be pursued.

NW Fifield ESA (21.2 acres) Most of the ESA has never been row cropped and as such has excellent potential for prairie-savanna restoration. The area has some large and small bur oaks, a few hickories and honey locusts, the later and aerial photography suggesting a pasturing history. Autumn olive, honey suckle, and elms have colonized some formerly open areas. The area has excellent prairie savanna potential.

4. Marina Peninsula Unit (245.4 acres; 133 acres above 774 elevation) The Marina Peninsula Unit is named after the shape of the unit (forms a peninsula) and the marina is located at the end of the peninsula. An old settlement era road forms an east-west road separation at the far north end of the unit (now known as marina fishing access). A recreation road (may be same alignment as old ridge trail) for the marina access dissects the unit on the top of the ridge, which separates the undeveloped ESA area on the west side from the marina areas (current and future areas) on the

east side. The unit is bordered by highway G28 on the majority of the north perimeter, and Dutchman's Landing along the northwest perimeter. The Volksweg Trail clips the north central edge of the northern heel of the tract.

Marina Peninsula ESA (69.5 acres) This is a large wooded tract that has sandstone outcroppings along the lake and glacial till exposed from erosion along the upper flood pool of the lakeshore. Large white oaks and savanna structured oaks are scattered throughout. Big and little bluestem, and other prairie species have been documented; the area does not have a crop history. This comparatively large tract has excellent potential for prairie savanna restoration. Methods should be employed toward that end.

5. Twin Prairies Unit (180.6 acres; 125.0 acres above 774 elevation) The Twin Prairies Unit is named after the two adjacent prairie reconstructions in the unit. The unit is completely divided by the Volksweg walking/biking trail. This provides excellent access to most of the unit, but heavy public use of the area can make management difficult during peak use times. The unit is surrounded by row crop fields and a high quality oak/hickory woodland stand (Sadler's Woods). The unit was recorded entirely as a savanna area. Most of the area historical land use since settlement was pasture, although some row cropping was evident in the northern portion. A nine acre pine plantation was planted in 1973. Two old fields were planted to a prairie reconstruction (the unit namesake); while the ESAs have a relatively undisturbed (pasture) landscape history. These areas have been subsequently heavily colonized by native and exotic tree and shrub encroachment. Prescriptions should be initiated to restore potential prairie areas, enhance reconstructed areas and remove pine plantations.

Twin Prairies Old Field ESA (30.2 acres) As the name implies this tract is an old field (pasture) with no known history of surface disturbance. The open areas have experienced heavy early successional growth of brushy and weedy tree growth. There is good potential for prairie restoration along with enhanced reconstruction south of the Volksweg Trail, and future reconstruction opportunities in pine plantations. The reconstruction is classified as an INRA.

Twin Prairies Woodland ESA (42.5 acres) A unique wooded ESA tract in a unit recognized for two prairie reconstructions. Originally probably more savanna than woodland, yet after decades of benign neglect has taken on the character of a quality old growth oak-hickory woodland, with a close juxtaposition to a similar private wooded tract to the east. There is a scenic view of the lake. Forest management practices should be initiated that remove prolific, shade tolerant species and favor regeneration of oak-hickory component. Herbaceous plants should favor spring ephemerals and woodland wildflowers.

6. South Tailwater Unit (303.9 total acres, 155.4 acres excluding dam, river and recreation areas) The South Tailwater Unit is named after the location of the unit, immediately downstream of the Red Rock Dam. The unit includes Ivan's campground, Volksweg Trail, recreation areas near the dam, and the COE maintenance buildings. There are four constructed ponds/wetlands within the unit, and river backwater areas. A unique river island and steep bluff hillsides provide vastly differing plant communities and the wildlife that use them. The unit was historically recorded as predominately woodland and was part of a large riparian corridor of woodland along



the river. Directly adjacent to the south was prairie with a savanna community. By 1970, the unit had changed dramatically with the construction of the dam and channelization of the river. A majority of the area was a borrow area for the embankment construction, and thus was cleared of all trees. The majority of the borrow area planted to prairie re-establishment, but small trees and brush are found in a few locations. Fields that were not in the borrow area came to have moderate and heavy colonization of invasive, exotic shrubs and shade tolerant native trees. The Gladys Black Area, owned and managed by the Iowa DNR, is within one-half mile of the STW Unit. Prescriptions should be followed to continue to favor the existing prairie reconstructions and savanna restorations. The woodlands are as diverse as the habitats represented in the unit, ranging from bottomland silver maple-cottonwood in the river bottom, to oak hickory along the bluff line, to mixed upland woods. Prescriptions should be followed to favor their unique character, with eventual removal of the pine plantations.

Ivans South Tailwater ESA (20.6 acres) This area has a quality oak hickory woodland and scattered large savanna structured white oaks. There is a scenic view of the river from the hill top, sandy bluff. A state threatened plant, yellow trout lily, was recorded here. Also included within the unit is an interesting eroded gully toward the northwest edge that reveals ancient subsurface strata. It likely formed from either localized, strip mining, or from extensive borrow activities during dam construction.

South Tailwater Island (Other Important Natural Resource Area) (24.1 acres) While not an ESA, this area is a unique island in the Des Moines River formed by the artificial creation of the pilot channel and former channel of the river. The island is native, river bottomland forest with the Volksweg Trail bisecting it. Much of the original forest composition of this type was lost due to lake construction and subsequent agricultural development downstream from the dam. The island and tall trees get heavy use by bald eagles in the winter for roosting.

- 7. South Overlook Unit (130.6 acres; 55.2 acres above 774 elevation)** One of the most impressive features of this unit is the view of the lake from the bluff top. It provided a natural observation area during the construction of the dam, where the dedication shelter is still located. This unit has one ESA and one identified important natural resource area. The ESA has portions of older growth woodland and two remnant prairies. The 1875 Andreas Atlas shows the area as a transition area between woodland and prairie; research indicates the prairie areas had never been plowed. Controlled fire and invasive shrub removal have opened up both the woodland and prairies, facilitating the growth of conservative plant species. The South Overlook Unit is bordered to the north and west by Lake Red Rock and to the east by the Red Rock Headquarters, Visitor Center and county road T15. A park road, parking lot and boat ramp are located in southern one-third of the peninsula. The area was named after the South Overlook Recreation Area that is the dominant, developed use of the unit. The Marion County and Red Rock radio communications towers are located here. The southern portion is an old field with a tree plantation and considerable alien shrub invasion. The Moingona Prairie re-establishment and the South Overlook INRA are found toward the east. The latter was formerly known as Knoxville Pond, and was a locally maintained picnic/day-use area. Continued clearing of invasive understory brush in the densely wooded sections, as well as frequent controlled burns in these

areas, will help achieve ecosystem management goals of restoring presettlement landscape conditions.

South Overlook N ESA (14.7 acres) This ESA consists of two remnant prairies with good species diversity and scenic lake views. The ESA has both quality woodland and prairie plant species. The woodlands have good restoration potential with several savanna structured oaks and a moderate density of redbud trees. Frequent controlled burns in this area, in various seasons, will help promote native herbaceous vegetation while deterring the growth of woody invasive plants. Allowing fire in the wooded areas will help transition the two remnant prairies and improve conditions for prairie/ savanna wildlife species.

- 8. Wallashuck Unit (266.6 acres; 113.7 acres above 774 elevation)** The unit was recorded entirely as a forested area in 1875. By the early 1900s approximately one-half of the unit was row cropped, with the sloped areas in pasture or woodland. Riparian areas had scattered trees; with open woodland; one older-growth woodland, and grasses. Two farmsteads were present in the unit. A significant change during the 1960s and 1970s was the creation of the campground. Woodland was cleared around the perimeter of the campground, but dense, closed canopy volunteer trees and shrubs took hold. All other areas in the unit were succeeding to brush, trees, tree plantation, or was dense pre-existing woodland. The Wallashuck Unit is used heavily for recreation, which provides excellent access, but heavy public use can compromise resource management. The Volksweg Trail serpentine the entire north side of the unit. The former sewage treatment lagoons will be converted to fish rearing ponds. There is a housing subdivision north of the unit. Minimal management and maintenance has been conducted in the unit, with the exception of two small reconstructed prairies and plantations. The dominant vegetation classification in the unit is old field/invasive brush in the understory due to extensive disturbance associated with past land use. Future goals have similar proportions of woodland (22%), prairie (25%), savanna (40%) and shrub land (13%) designated for the unit. Management strategies should focus on removal of the extensive exotic and native volunteer woody growth that has hindered the prairies and savannas, and improve the remaining quality woodlots. Vista clearing of undesirable shrubs near the campground should be performed. There are no ESAs in the unit.
- 9. Stoney Point Unit (329.6 acres; 228.7 acres above 774 elevation)** The Stoney Point Unit is named after the rocky bank along the north shore of the unit. There are three ESAs and one important natural resource area in the unit. Stoney Point unit was recorded as woodland in the north two-thirds of the unit, with the remaining recorded as prairie. The area was part of a transition zone of woodland corridor to prairie associated with the Des Moines River and likely had savanna characteristics. Two coal mines were recorded near the northwest section and coal spoil piles can still be found. Pennsylvanian era plant fossils have been recovered in these spoil areas. By 1970, much of the unit had changed dramatically, with many of the pastures and crop fields engulfed in natural succession. A large section in the middle of unit became a soil borrow area for the dam construction. At the Stoney Point Unit, invasive brush covers 69% of the land above 774 ft elevation. The majority of these areas are a moderate density of invasive shrubs. These areas were heavily grazed, row cropped, or were borrow areas, which were then planted



with honeysuckle and autumn olive in the plantation species mix. However, there are also high quality woodlands and old field woodlands in the unit. The unit is bordered by Lakeside Heights subdivision along the southwest borders. Woodland and row crops are found along the remaining private land perimeter. An electrical right-of-way crosses the unit in the southeast one-fourth, and 180th Avenue dissects the northwest portion of the unit providing access to the lake. Management activities should focus on control and removal of the exotic invasive shrubs. In addition, strategies to preserve and recover the savanna remnants should be initiated.

Stoney Point W ESA (8.1 acres) This ESA is an excellent older growth oak/hickory woodland with a diverse, quality herbaceous layer. The woodland was recorded as woods in historic references and likely never completely cut. Access to the area is very difficult.

Stoney Point C ESA (20.8 and 3.2 acres) Comprised of two tracts in close juxtaposition to each other, this ESA has a former borrow site separating the areas. The ESA has good potential for savanna restoration, with large savanna structured oaks scattered throughout. Most of the land has little history of serious disturbances. Access to the area is difficult.

Stoney Point S ESA (21.5 acres) Like the preceding two ESAs, this area also has excellent potential for savanna restoration and has large, savanna structured oaks. The GLO notes and Andreas Atlas has the north portion recorded as wooded and south part as prairie; likely a savanna or transition zone. In addition, there is a historic strip mine that also has a unique lichen population.

10. The Howell Station Unit (278.8 total acres) (152.3 acres excluding dam structures and recreation areas) The Howell Station Unit is named after the railroad station once located near the unit. The former Wabash Railroad line is located on the north edge of the unit. No ESAs or important natural resource areas have been identified. There are no remnant communities present in the unit and the entire area has a crop history. The entire unit is in the Des Moines River floodplain, with the exception of the dam structure. The unit includes the Howell Station campground, recreation areas near the dam, numerous tree plantations, reconstructed prairies and wildlife food plots. There are three constructed wetlands and an old sand quarry pond within the unit. The southern boundary of the unit is the pilot channel of the Des Moines River. The Howell Station Unit vegetation community goals are dominated by woodland (53%), and include prairie (30%) and shrubland (17%). The area is also includes the future site of the Red Rock Hydropower plant. The North Tailwater Recreation Area will be closed until 2018 for construction. While no ESAs are identified here, the tailwater area is recognized as one of the most visited fisheries in Iowa. The tailwater also attract large numbers of ducks, gulls, shorebirds and bald eagles.

11. The North Overlook Unit (286.4 total acres (194.5 non-recreation acres above 774 elevation)) The location of the unit, which overlooks the lake and the Des Moines River below the dam, gives an obvious relationship with the unit name. The northern portion of the unit was historically prairie, while the southern portion was classified as woodland. The woodlands north and east of North Overlook Picnic Area are considered good quality oak-hickory timber with a rich species diversity of woodland ephemeral plants. An old historic lane is now part of the North Overlook Nature Trail. A pioneer cemetery is located on private land immediately off the Red Rock fee

boundary, but the nature trail provides a convenient way to access it. There are no ESAs in the unit. The unit is adjacent to Eagle Ridge subdivision along the northeast border. Row crops and woodland are adjacent in the remaining perimeters of the unit. Highway T-15 dissects the unit, with a recreation road below the dam along the southern perimeter of the unit. North Overlook campground and the North Overlook beach areas are excluded in the resource management recommendations. The Volksweg Trail traverses the unit laterally, and the North Overlook Nature Trail provides a loop trail throughout the woods. The beach area and land to the north of the beach was a borrow site for the dam construction. Part of this area became a tree plantation and open areas became colonized by exotic, invasive shrubs. A pine plantation was established on the western edge of the unit. No endangered, threatened, special concern plant species or SGCN wildlife species are identified within the North Overlook Unit. However, five Indiana bats, an endangered species; and one evening bat, a SGCN species, were identified in 1980 less than 100 meters from the northwest perimeter of the unit. Vegetative community goals for the unit (woodland 76%, prairie the 15%, savanna 4%, shrubland 5%) will greatly expand the existing prairie community. The majority of the new prairie designated sections are in areas currently planted to pine trees or dominated by invasive shrubs. Future management strategies should favor elimination of any woody or herbaceous plants that are not native to this area, while prescriptions to perpetuate the quality of the woodland area should be planned.

12. Whitebreast Unit (365.1 acres; 184.7 acres above 774 elevation) The Whitebreast Unit is a unique bluff land with sandstone rock outcroppings and three identified ESAs. The unit is a peninsula bordered by Lake Red Rock on three sides, with the Competine Bay Unit, Lakeview subdivision, and private agricultural fields to the south. Paved roads (S-71 and a park access road) divide the unit into 4 sections. Whitebreast campground, a boat ramp, and a swimming beach are located in the northern half of the unit, making the recreation features a significant landscape development. The Stu Kuyper hiking trail runs through the south east section of the unit, ending at a youth campground site. The remaining area likely has minimal disturbance due to rough terrain. The developed road system and open vistas of the lake has led to the area being known as a birding hot spot. The unit has a few older growth woodland areas that were subject to historic logging, but were never completely cleared. Occasional controlled fires in the fall for forested areas will help achieve ecosystem management goals of maintaining oak woodland communities within the ESAs, while minimizing damage to sensitive spring ephemerals. Some timber stand improvement may be required to maintain the oak-hickory forest community.

Whitebreast N Shore ESA (7.9 acres) The ESA features a scenic overlook adjacent to the campground, with quality oak-hickory forest and oak savanna restoration potential. The ESA was likely a wooded pasture in the south half, with the north half and ravines heavily wooded. It is dominated with white and red oaks, with several savanna structured white oaks. A few very large shagbark hickory trees and mix of pole to large basswood and walnuts occur in the ESA. The understory sapling layer is primarily black maples. Yellow trout lily, a threatened species, was recorded in 1978.

Whitebreast Point ESA (9.7 acres) This ESA is located at the tip of the Whitebreast peninsula and has unique sandstone bluff rock outcroppings. The original streambed of Whitebreast Creek



abutted portions of the ESA. Large shagbark hickory and basswood trees are found throughout the ESA as well as several open grown white oaks along bluffs. There is a moderate density of bottlebrush grass in the south east two-thirds of ESA, which is an indicator species for quality woodland. Historical air photos show the ESA as dense woodland, with minimal disturbance. There are several possible wildlife den sites associated with the rock outcroppings.

E Whitebreast ESA (36.7 acres) A quality older growth oak-hickory woodland, with steep banks into the lake. The majority of the ESA was likely never completely logged and is dominated with very large, tall, and straight white oak, red oak, and shagbark hickory trees; indicating minimal disturbance. Several savanna structured white oak trees occur as well. Historical air photos show dense woodland to open woodland in portions of the ESA, but the section was never row cropped. The ESA borders the Stu Kuyper hiking trail on the east and south portions, with sections of trail in the interior of ESA, providing scenic overlooks of the lake. The area provides important feeding and roosting habitat for wild turkeys.

13. B Prairie Unit (885.61 acres; 41.62 acres above 774 elevation) The B Prairie Unit is named after the highest quality prairie remnant that is found at Red Rock Project. The unit extends from the old Highway 14 access to the north shore of Whitebreast Creek to the southwest, and aligns with the former county road 108th Street, that connects the north and south shores of Whitebreast Creek. It is bordered on the south by Black Unit; to the north by pasture, and row crop fields on adjacent private lands. The western border joins the Tondaville Unit; Highway 14 creates the eastern border. This unit has three identified ESAs and two Important Natural Resource Areas. The ESAs include remnant tallgrass prairie, oak savanna, and oak woodland habitats. Some sections of the ESAs have been intensively managed to promote open prairie and savanna habitats, while other sections have become overgrown with both native and exotic shrubs. The woodland sections were likely never cut extensively. The ESAs are located along the present day lake shore at both the east and west ends of the unit, and separated by six unnamed tributaries. The remainder of the unit consists of a thin ribbon of land along Whitebreast Bay, much of which in the lower elevations above 750 is agricultural leases. At normal pool the severe lake sedimentation problem is evident. Continued clearing of invasive understory brush in the densely wooded sections, as well as frequent controlled burns in these areas in appropriate seasons will help achieve ecosystem management goals of restoring presettlement landscape conditions.

NW Old Highway 14 ESA (8.3 acres) This tract is a quality, old growth oak-hickory timber that likely has never been clear-cut. Originally recorded as prairie, it is now wooded with black, white and burr oak, along with hickory. The herbaceous layer has a wide diversity of quality spring ephemeral woodland plants.

East Old Highway 14 ESA (7.9 acres) Fragmented from the larger unit by old Highway 14 and current Highway 14, this tract possesses large structured white and burr oaks with good potential for savanna restoration, despite a history of being badly grazed. Rim erosion has yielded large sandstone rocks, outcroppings and plant fossils.

B Prairie ESA (29.7 acres) This area includes NAI remnant prairies, oak savanna, and oak

woodland habitats. Some sections of the ESAs have been intensively managed to promote open prairie and savanna habitats, while other sections have become overgrown with both native and exotic shrubs. In aerial photos from the 1930s, the southern sections of the ESA appear to have been plowed. Woodland sections were likely oak savanna habitat, with the understory kept clear in the past by grazing. These areas remained as open woodland/savanna until the early 1970's. Management strategies should be continued to maintain this valuable remnant. Invasive tree and shrub removal practices should be extended to include the densely wooded sections of this ESA.

14. Butcher Creek Unit (449.66 acres; 264.4 acres above 774 elevation) This unit is named for Butcher Creek which runs through the length of the unit from the northwest to the southeast. A railroad right of way further defines the geographic separation by a similar northwest-southeast alignment. The unit is almost completely surrounded by private farmland and the southeast corner borders the Tondaville Unit. There are two food plot permits and one agricultural lease established. The Butcher Creek Unit is one of interesting contrasts. The unit was recorded as prairie with a grove of trees. It includes a bur oak savanna, with numerous large open grown trees, that somewhat align to the aforementioned grove. Some areas were likely never cut due to the rugged topography. A historic coal strip mine was present within the unit, with spoil piles, remnants of wooden tracks and a conveyor belt abandoned on site. The majority of the unit is covered by moderate to high densities of invasive shrubs. Plus, a large single species stand of black locusts occurs on the edge of the ESA and is encroaching on the prairie reconstruction. The reconstruction is located on a former borrow site has a diverse mix of forbs, grasses and sedges with the largest population of lead plant on project lands. Management goals should include occasional controlled burns in all upland areas, as well as removal of invasive shrub species, to achieve ecosystem management goals of reconstructing presettlement landscape. The unit has one ESA and one important natural resource area. Access is primarily through adjacent private property; a limitation that should be rectified in the future. Timber stand improvement should be conducted to release the oak trees and to maintain an open oak woodland community. Controlled burns in November will help achieve ecosystem management goals while minimizing damage to spring ephemerals.

Butcher Creek Woodland ESA (42.7 acres) This ESA is a bur oak savanna and white oak woodland with the southern edge largely old field succession. This area includes a historic coal strip mine. The woodland areas are dominated by white oak, honey locust, and black locust, with hackberry and elm the dominant understory species. There is a high density of invasive trees surround the oaks (old pasture). Large savanna structured white oaks are found along steep banks of the east ridge, with dense bottle brush grass.

15. Competine Creek Unit ((254.66 acres; 93.65 acres above 774 elevation) It is named for Competine Creek which runs along the northwest side of the unit, before entering Red Rock Lake. The unit is almost completely surrounded by private agricultural lands with part of the north border adjacent to the Hickory Ridge and Competine Bay Units. The Competine Creek Unit includes several small openings of degraded prairie with some native species still present. Three potential ESAs (degraded prairie openings) were surveyed within the unit. Native woodland exists along the creek edge and diverse tree plantations are found on upland slopes. The old fields, small



remnant openings and tree plantations were heavily infested with exotic and native invasive woody plants. Aggressive brush removal and periodic mowing have been conducted to recover these fields. Management goals should include frequent controlled burns in all upland areas (woodland, old field growth, prairie), as well as continued removal of invasive species. Some removal of invasive trees (elm, honey locust, red cedar), as well as planted trees inappropriate for oak savanna restoration will be required to achieve ecosystem management goals of reconstructing presettlement landscape. Despite the potential to restore native landscapes, there are no identified Environmentally Sensitive Areas (ESAs).

16. Eagle Rock Unit (357.69 acres; 186.31 acres above 774 elevation) This unit is located along the north shore of Whitebreast Bay of Red Rock Lake. Eagle Rock is an historic name for the sandstone bluff of the Eagle Rock peninsula, apparently where eagles had nested at the time of settlement. Eagle Rock Unit is bordered by Lake Red Rock to the south, where portions are subject to high lake pools. Private agricultural fields and some woodlands border the unit to the north and east. The western border is Highway 14. Four ESAs and one important natural resource area have been identified within the unit. The majority of the unit consists of old fields with dense red cedar and dogwood thickets; small openings of native prairie species; and bordered by oak-hickory woodland. Old field portions consist of sapling to pole sized invasive trees with the surrounding wooded areas consisting primarily of sapling to medium sized red oak and hickory. There is potential for prairie restoration in the old fields, but motorized access would be difficult. Management goals should include frequent controlled burns in all upland areas (savanna, old field growth, prairie), as well as removal of invasive tree and shrub species.

E Eagle Rock Peninsula ESA (21.4 acres) This is an important eagle roost site with unique geographical and geological characteristics. The tract provides views from the ridge top of Whitebreast Bay and a small unnamed bay in Red Rock Lake. Historic records note eagle nest sites along sandstone bluffs in eroded pockets in bluffs. There is quality old growth woodland present, with large mature red and white oak trees. Several savanna structured white oak trees are found on the east end. Potential exists for oak savanna and bluff prairie restoration. A threatened species, slim-leaved panic grass, was recorded in the ESA in 1957. Management goals should include frequent controlled burns, as well as removal of invasive tree and shrub species to achieve goals of restoring prairie and oak savanna habitats.

W Eagle Rock Peninsula (Other Important Natural Resource Area) (26.6 acres) While not an ESA, this area historically was recorded as tallgrass prairie and oak savanna, now heavily invaded with dogwood, honeysuckle and autumn olive. The old fields are covered with dense brush, but there is potential for prairie restoration, as small openings have numerous prairie species still present, even though it was row cropped in the past. Wooded areas along the shoreline are dominated by pole size black oak trees. Frequent controlled burns, in addition to invasive tree and shrub removal will help achieve ecosystem management goals of restoring prairie and oak savanna communities.

Hwy 14 Eagle Rock Peninsula ESA (11.3 acres) A scenic oak-hickory woodland with steep banks and ravines running toward the lake. The rocky bluffs overlook Whitebreast Bay and

Highway 14. The woodland was clear cut in the past and was also heavily grazed historically. Several trees are noted to have old fire scars. The stand is dominated by old growth white oak, red oak, and shagbark hickory trees. Management goals should include occasional controlled burns, and timber stand improvement as needed, to maintain the oak-hickory woodland ecosystem within this ESA.

17. Highway 14 Unit (318.55 acres; 128.8 acres above 774 elevation) This unit borders Highway 14 to the west; Whitebreast Bay to the north; private agricultural lands and some forest to the south and east. A small section in the northeast corner borders the Roche Street Unit. Two ESAs and one important natural resource area have been identified within the unit. The majority of the unit above the 774 elevation consists of old fields (including remnant prairie species), with moderate to dense cover of invasive shrubs. Some oak woodland is also present. The south quarter of the resource area was described as wet prairie in field surveys from the 1980's, with several wetland species. Management goals should include frequent controlled burns in all upland areas (savanna, old field growth, prairie), as well as continued removal of invasive tree and shrub species to restore tallgrass prairie and oak savanna communities within the unit.

Whitebreast Bay Bluffs ESA (23.5 acres) A rugged terrain of deeply cut ravines with large savanna structured white oaks along the bluffs; old growth red oak and basswood trees in the interior. Rock outcroppings along bluffs include a mix of coal, shale, conglomerate rocks, granite glacial till rocks, red and white sandstone, sandy banks, and areas with heavy iron leaching out of the banks. The majority of this ESA was never row cropped due to rugged terrain. There is good potential for restoring old growth quality woodland in these areas. Native herbaceous cover in forested areas includes high quality species. Savanna species are found along the outer edges towards the lake. Old field areas are mostly pole sized honey locust, but numerous red oak, hickory, and walnut trees are also present. Management efforts should include the removal of invasive trees and shrubs. Occasional fall burns will be needed to encourage the growth of native herbaceous species, which may be present in the seed bank.

HWY 14 W ESA (11.9 acres) This ESA features a tree covered hillside overlooking Whitebreast Bay to the north. The south portion has large savanna structured bur oaks with bur oak saplings scattered throughout (great potential for a restored and future bur oak savanna). The majority of this area was likely pastured, but never row cropped. A hand dug sandstone block well can still be found on an old farmstead along the west border. Management goals for this area are to restore the former oak savanna and prairie ecosystems. Invasive tree removal will be required, as well as continued removal of invasive shrub species. Frequent controlled burns will aid in restoring the presettlement landscape conditions to this area.

18. Tondaville Unit (932.41 acres; 279.68 acres above 774 elevation) The Tondaville Unit is named after a small housing development that is located on private land in-holding at the southern end of the unit. The unit is bordered to the east by the Lisbon and B Prairie Units, with Whitebreast Creek the feature separating the tracts. Much of the northern and western border adjoins private agricultural lands. A small section to the west adjoins the Butcher Creek Unit. The southern border is Hwy 92 and the South Whitebreast Creek Unit. There are large areas that have



been used for cut and fill for railroad and highway right of way construction. The majority of the unimproved unit above the 774 elevation consists of old fields, with moderate to dense cover of invasive shrubs. Part of the area was planted as tallgrass prairie (K prairie) in 1983. A unique wet meadow and quality oak woodlands are also found here. Tondaville Unit has one ESA and two important natural resource areas. The unit has a large agricultural lease and two small food plot permits. A railroad right of way divides the tract at about the middle of the area. Management goals should include frequent controlled burns in all upland areas as well as continued removal of invasive tree and shrub species to maintain oak woodland and restore tallgrass prairie and oak savanna communities within the unit.

Tondaville Woodland ESA (28.3 acres) The woodland is characterized as quality oak-hickory woodland on a hilltop overlooking Whitebreast Creek and oxbows. The wooded areas were likely never completely cut and several savanna structured white oaks remain. The upland forest areas are dominated with black oak, red oak, white oak, bur oak, and shagbark hickory trees. Unique swamp white oaks are found along the lower elevations and ravines. There is good diversity of herbaceous understory species. Some sections of the ESA have potential for oak savanna restoration. Management goals should include frequent controlled burns in all upland areas, as well as removal of invasive tree and shrub species to maintain oak woodland and restore oak savanna communities within the ESA.

19. Roche Street Unit (526.47 acres; 299.93 acres above 774 elevation) The unit is bordered by Red Rock Lake on the north and west sides, and private land in rowcrop fields along the south and east perimeters. The area is partially divided by a dirt access road from the southwest corner. The unit was recorded as a prairie, with minimal portions of forest along the north edge of what was then the Des Moines River floodplain. This portion of the unit is now in the current flood pool of the lake. A road divided the southern one-third of the unit and a homestead was located in the south-east corner. The old road is the same road as is now in use. The area has a history of intense agricultural uses of pasture and row crops, except for ravines and creek banks. As such, there is little opportunity for remnant communities to be restored. There are no identified ESAs or important natural resource areas within the unit. A headstone is located on the unit, implying that the area may have an unrecorded cemetery. However, the deceased has another headstone located in another cemetery, making the presence of human remains somewhat suspect. After Corps acquisition, some of the former crop fields were planted to trees in the late 1970s and 1980s. Other fields became primarily old field growth and second growth forest. Three sections of reconstructed tallgrass prairie in the south west portion of the unit were planted. Efforts to remove invasive shrubs have been ongoing since 2011. Current management practices have maintained the Roche Street Unit in a habitat mix ideally suited for bobwhite quail. To restore presettlement landscape conditions in the area, long term management goals should include prairie reconstruction, along with frequent controlled burns in all upland areas (woodland, old field growth, prairie). Removal of invasive tree and shrubs, plus removal of planted tree species which are not associated with grassland communities, should be part of future management efforts.

20. Teter Creek Unit (603.67 acres; 152.28 acres above 774 elevation) The unit is named for Teter Creek, which divides the unit north and south. Access to the area is very limited and is mainly by

foot, boat or across private land. The Teter Creek Unit is bordered by Highway 14 to the east and divided east and west by the gravel road 115th Place. The unit is almost completely surrounded by private land, primarily row crop, pasture, and Conservation Reserve Program. Substantial portions of the unit (153.3 acres) are inundated by Red Rock Lake during high water events. There are three agricultural leases within the unit. The area was originally classified as prairie, except the area toward the Des Moines River and west of current Highway 14, which was woodland. There are no identified ESAs; however, there are two identified important natural resource areas within the unit. The west unit may have a prairie remnant; although that is uncertain. The areas associated with drainages did not have row crop disturbance. The upland tract on the west side consists of a tree planting, a reconstructed prairie, and adjacent forested areas. The middle important natural resource area includes a reconstructed prairie with dense native and exotic shrub growth; a small food plot; old field woody growth; a walnut planting; and a two acre section of bur oak dominated woodland with potential for savanna restoration. Management goals should include frequent controlled burns in all upland areas (woodland, old field growth, prairie), as well as continued removal of invasive tree and shrub species to maintain oak savanna and restore tallgrass prairie within the unit. Harvest of planted tree species which are not associated with grassland communities should be part of future management efforts.

21. South Whitebreast Creek Unit (921.85 acres; 73.91 acres above 774 elevation) The South Whitebreast Creek Unit is named for Whitebreast Creek which divides the unit east and west. The majority of the unit is below 774 elevation and is an excellent waterfowl, amphibian, and shorebird production area. The dominant feature of the unit is flood pool that is leased to farmers for row crop production. The elevation of the ag leases is such that in normal years a crop can be planted and harvested; otherwise, the fields if fallow would produce abundant crops of undesirable weeds. Whitebreast Creek has deeply down-cut the channel, due in large part to the stream straightening that occurred in the early 20th century. Former creek oxbows meander through the ag leases, providing shallow water wetland areas. There are three identified important natural resource areas within the unit and no ESAs. The upland portions of the unit are primarily old field woody growth. There is a reconstructed tallgrass prairie and tree plantation at the north end. Small areas of remnant oak-hickory forest and bur oak savanna can be found in the uplands. Lowland wooded areas are dominated by silver maple and cottonwood trees. The South important natural resource area (21.8 acres), Nevada Street important natural resource area (29.1 acres), and Hawk Run (23.2 acres) are all oxbow wetlands, subject to inundation at high lake levels. The South Whitebreast Creek Unit is bordered by private agricultural land on the south, west, and east sites. Hwy 92 creates the northern border, where the unit ajoin the Corps' Tondaville and Lisbon Street Units. The South area has been considered for moist soil unit management strategies, wetland construction, and more intense wetland management in the past. Future goals should endeavor this effort. Management goals should include fall burns in all upland areas (woodland, old field growth, prairie), as well as continued removal of invasive tree and shrub species to restore oak savanna and tallgrass prairie habitats within the unit.

22. The South Elk Rock Unit (443.43 acres; 136.64 acres above 774 elevation) The South Elk Rock Unit is just south of the Elk Rock Unit, with much of it is below 774 elevation and subject to inundation at high water levels. There are no ESAs or important natural resource areas identified



within the unit. The South Elk Rock Unit is a peninsula bordered to the north, east and south by Red Rock Lake and mostly agricultural fields on private land to the west. A small portion of the northwest corner abuts the USACE Elk Rock Unit. The upland portions of the unit are primarily silver maple-cottonwood dominated forests, black locust stands, and old field woody growth. Prairie reconstructions and pine trees have been planted in the southern portions of the unit. Management goals should include fall burns in all upland areas (woodland, old field growth, prairie), as well as removal of invasive tree and shrub species to restore oak savanna and tallgrass prairie habitats within the unit. Timber stand improvement should be conducted to maintain some sections as open oak woodland communities.

23. Lost Lake Unit (185.13 acres; 90.6 acres above 774 elevation) The majority of the Lost Lake Unit was a coal strip mine, which has been predominately reclaimed, but limits the potential for quality areas. Much of the remaining areas were row cropped or pastured. One Important Natural Resource Areas (INRA) is identified in the unit. The northwest corner of the unit joins with the USACE Roche Street unit. A housing subdivision and private agricultural lands form the unit border on the south and west sides. To the east is USACE Hickory Ridge Unit and Red Rock Lake is the northern boundary of the unit. The reclaimed coal mine areas have been planted to tallgrass prairie species. A large pond (formed during coal mining operations) remains in the center of the unit. Lowland forest areas are dominated by cottonwood and silver maple trees. The INRA (4.3 acres) is an older growth bur oak stand with minimal disturbance. The area was likely never logged (due to the dense canopy cover with large trees identifiable in 1930s aerial photos). The understory is dominated by hackberry, black oak, basswood, elm, and ironwood trees. Notable herbaceous plants include Jack-in-the pulpit and wild blue phlox. Management goals should include frequent controlled burns in all upland areas (woodland, old field growth, prairie), as well as continued removal of invasive tree and shrub species to maintain bur oak woodland and restore tallgrass prairie within the unit. This area will be future hackberry woodland without forest management, as there is minimal bur oak recruitment.

24. Lisbon Street Unit (647.66 acres; 12.49 acres above 774 elevation) The Lisbon Street Unit is almost entirely below 774 elevation. Only 12.5 acres are high enough to maintain permanent vegetation. Most of the unit is comprised of mud flats or agricultural leases, and black willow riparian forest. At the time of settlement the entire unit was woodland. The formerly meandering grass-lined Whitebreast Creek was channelized in the 1920s, and the accelerated flow exacerbated erosion of the straightened stream channel. The remaining oxbows provide excellent wetland habitat when not flooded. One important natural resource areas is identified with no ESAs in the unit. The Lisbon Street Unit is bordered to the north and west by Whitebreast Creek. The Tondaville Unit lies to the west. Private agricultural fields and forested areas form the east boundary, with Highway 92 and South Whitebreast Creek Unit along the southern edge. A few, very large cottonwoods and silver maple trees are found in lowland areas. A few swamp white and bur oak trees are unique in the bottomlands. Portions of the area are densely covered by native buttonbush shrubs, while the majority of the ground cover is weedy herbaceous growth. This area is important habitat for shorebirds, waterfowl, and is home to an abundant population of cricket frogs, an amphibian in decline in Iowa. The area is heavily used by waterfowl hunters. An old railroad right of way and a new railroad right of way dissect the unit at about the mid-length of

the unit. Road accesses include 108th Street on the north and Lisbon, the unit namesake, located near the middle. A remote road formerly joined the two roads, but flooding and sedimentation made continued maintenance of the road impractical. Two former roads that led into the south part of the unit have been abandoned. Little management effort is needed in this unit. A small portion of woodland on in the south east corner, designated as a savanna management area, should be burned periodically to restore open oak woodland conditions. Wetlands should be maintained and wood duck nest boxes may be installed as necessary, to promote waterfowl production.

25. Black Unit (348.81 acres; 9.39 acres above 774 elevation) The majority of Black Unit is below the 774 elevation and is subject to high lake pool levels. No ESAs or important natural resource areas have been identified within the unit. The few upland areas have been mostly clear-cut and are small in size. These areas are primarily old field growth and oak-hickory forest. The unit is bordered to the north by Whitebreast Bay of Red Rock Lake; to the south and east by row crop fields, pasture, and woodlands on private land. A small section of the northwest corner joins the Lisbon Street Unit. The northeast corner joins the Highway 14 Unit. All of the upland areas within the Black Unit have woodland vegetation communities as the primary ecosystem management goal. Old field growth areas should be cleared of invasive shrubs and planted sparsely with bur oak trees on level ground and white oak trees on slopes. Timber stand improvement practices should be conducted in the existing oak hickory forest as needed. All upland areas should be burned periodically to promote native herbaceous vegetation and maintain open oak woodland communities.

26. Elk Rock Unit (986.75 acres; 891.04 acres above 774 elevation) The Elk Rock Unit has as much complexity and quality features as any unit at Red Rock Project. The name Elk Rock has been attributed to the unusual rock formation along the north shore of the unit. Sandstone rock outcroppings are found along the bluffs, with steep, deeply cut ravines, and large hillsides near the lakeshore. The bluffs provide scenic view of the lake, and from the lake, impressive views of the massive sandstone bluffs. Areas of very sandy banks occur along the shore line. Numerous Pennsylvanian Period (320 million years - 286 million years ago) plant fossils occur along the banks in sandstone (e.g., *Lepidodendron* scale trees, *Sigillaria* trees). Woodland period (500 B.C – A.D 1000) burial mounds are located within the unit. The site was recorded as a forested ridge top, overlooking the Des Moines River valley in GLO notes and the 1875 Andreas Atlas, although most likely was more savanna-like. Today, this unit has one of the largest, contiguous upland forests in the Red Rock Project area. Large trees along the lake shore provide important roost sites for bald eagles. The Elk Rock Unit has two identified ESAs and three identified important natural resource areas. Portions of the unit were cleared for pasture by the 1930s and remained open until the 1980's. There is good access to the unit from roads and trails in Elk Rock State Park. As a developed state park, the park features two boat ramps, campground and equestrian area. The park trail system is especially favored by horseback riders. The South Elk Rock picnic area, whose use and maintenance had declined over time, was relinquished from the state outgrant and will be developed as an archery sport area.

East Elk Rock ESA (34.4 acres) This is the largest tract of quality oak woodland and the least disturbed ESA in the Elk Rock Unit. Woodland Period burial mounds are located nearby, along



ridge tops of the former Des Moines River valley, and provide scenic overlooks of the lake. Steep, deeply cut ravines dissect the ESA. Small openings exist within the closed canopy woodland. Currently the wooded areas are dominated by large basswood, white and red oak trees. Numerous savanna structured white oaks can be found, indicating the potential for oak savanna restoration. The area gets heavy public hunting use and is also an important winter roost site for bald eagles. Management efforts should include timber stand improvement to release the oak trees, as well as prescribed fire to restore the presettlement open oak woodland community.

Elk Rock Little Bluestem Prairie ESA (92.7 acres) This ESA has the largest little bluestem prairie remnant in the Red Rock Project area, with a quality oak-hickory woodland along the lake. The area provides a scenic overlook of the lake from 60-foot tall vertical sandstone outcroppings. This ESA is the area where the name Elk Rock has been attributed to the unusual rock formation along the shore line. It is also the most remote and gets the least public use of any in the Elk Rock Unit. There are some old field areas of very thick invasive trees (black locust, honey locust, elms) and shrubs (autumn olive). Small clumps of scattered broomsedge bluestem, switchgrass, and round-headed bush clover are found in other openings with heavy infestation of cool season pasture grasses. Dominant woodland species include large basswood, white oak and red oak trees, with a few savanna structured white oaks. There is oak savanna restoration potential in north portions of ESA. Two threatened plant species and a state special concern reptile have been documented. The area gets heavy bald eagle use during winter months. Management efforts should focus on maintaining and expanding the existing prairie remnant, while restoring the oak woodlands with prescribed fire and invasive tree removal.

27. Roberts Creek Wildlife Unit (422.7 acres; 230.9 acres above 774 elevation) The unit was named for Roberts Creek, and the creek was named after R.S. Roberts, who was noted as the landowner on the 1875 Andreas Atlas. The creek is also known as Wildcat Creek. The creek runs through the east and central portions of the unit. Most of the unit was historically recorded as woodland. The area currently is composed of small to large stands of oak-hickory forest along with cool season pastures and tallgrass prairie reconstructions. There are numerous granite glacial till rocks that are exposed on hillsides. Some of the oak-hickory community is being replaced by hackberry and elm trees, with the absence of large herbivores and fire. Some areas with open grown bur oaks and white oaks may have potential for savanna restoration. The Roberts Creek Wildlife Unit has one identified Environmentally Sensitive Area and three identified important natural resource areas.

N Roberts Creek ESA (34.6 acres) This is a large tract of quality oak-hickory woodland, sloping down to the Wildcat Creek bottom. The area was recorded as forested in GLO notes and the 1875 atlas. Has remained closed canopy woodland since 1930 and likely has had minimal disturbance. There is excellent access to the site along Dubuque Street. The east ridge of the ESA has several tall and straight, forest grown red oaks and shagbark hickories. Several large red oaks have fallen over and the woodland is giving way to a hickory, hackberry and elm dominated community. On the west ridge the forest is dominated by large white oaks and some are savanna structured. Pole to large size bur oaks are found along ravines and in the lake flood pool area. Future management efforts should include the removal of invasive shrubs (e.g. dense honeysuckle in east one-quarter), as well as occasional controlled burns to maintain the oak-hickory forest community.

28. Roberts Creek Recreation Unit (901.8 acres; 449.7 acres above 774 elevation) The Roberts Creek Recreation Unit shares the same history as the wildlife unit, but is managed as a recreation area. The entire area was recorded as forested in GLO notes and the 1875 Andreas Atlas. Today the unit consists of a large wooded tract overlooking Roberts Creek Lake. The majority of the area is old pasture woody growth, with areas of quality oak-hickory forest. A historic lane through the east side of the unit is maintained by the Marion County Conservation Board (MCCB). The MCCB also operates campgrounds in the south-west and south-east quarters of the unit. A causeway at the south end of the unit provides views of Roberts Creek Lake and Lake Red Rock. This area is popular for viewing waterfowl by the public and is heavily used by anglers. There is excellent access to the unit from Highway G28. The Roberts Creek Recreation Unit has one identified Environmentally Sensitive Area and one identified important natural resource area.

SW Roberts Creek ESA (112.5 acres) This tract is a large, remnant oak-hickory forest on the west side of Roberts Creek Lake, and is one of the largest wooded tracts on the Red Rock Project. However, there is severe need for timber stand improvement and invasive woody species control. Currently, the wooded areas are dominated by green ash, honey locust, hackberry, and Ohio buckeye trees. Several very large open grown white oak, red oak and shagbark hickory trees are present and some herbaceous savanna species can still be found. With increased management efforts, including frequent fall burns, there is potential for oak savanna restoration. One special concern butterfly species, the wild indigo dusky wing and one endangered mammal, the Indiana bat, have been recorded. Marion County Conservation Board reserves development opportunities for small primitive cabins on the center ridge of the ESA.

29. Competine Bay Unit (330.97 acres; 135.71 acres above 774 elevation) The area was named for the Competine Bay of Lake Red Rock. The area was originally mapped as prairie, except for the “knob,” which was noted to be forested. Now, most of the unit is floodplain forest, dominated by silver maple and cottonwood below the lake flood pool, with some old field woody growth and a pine plantation above the 774 elevation. The unit has one productive, higher elevation agricultural lease, food plots and food plot permit fields. The Whitebreast Unit is located to the north, while the Competine Creek Unit is located to the south. Access is excellent on the north side, but gully erosion limits convenient access farther south. Access to land in the middle of the unit can be gained from private landowner to the east, but ideal for long term needs. The southernmost section is accessible from Kennedy Street. The knob on the west side contains a small oak-hickory forest remnant. The Competine Bay Unit has no identified ESAs and one identified Important Natural Resource Area.

Competine Knob ESA (4.4 acres) A unique knob with a quality oak-hickory woodland, that has not been cleared since settlement. The area was recorded as forested in GLO notes and in the 1875 Andreas Atlas. There are steep bluffs along the lakeshore, with large fallen sandstone rocks along the bank. Currently the west one-quarter is dominated by pole to large sized white oak, black oak, shagbark hickory, and hackberry trees. The remainder is sapling to pole sized invasive trees, with a few hawthorns. There is some bottlebrush grass in the west one-quarter. There is potential to expand the oak-hickory woodland into the east if the old field is cleared of invasive trees. Management efforts should also include occasional controlled burns in fall to maintain the oak-hickory community.



30. Hickory Ridge Unit (250.21 acres; 120.67 acres above 774 elevation) The Hickory Ridge Unit was the location of the former Hickory Ridge Campground, a private campground that became defunct. Acquisition efforts were led by the Iowa Natural Heritage Foundation and the Red Rock Lake Association, who donated the property to the Corps of Engineers. After the property was acquired Red Rock maintenance staff commenced demolishing old camp buildings, with the exception of a large picnic shelter that was spared. Some of the former campsites have been maintained for a paddle in campground. The unit currently has two food plot permit fields, one of which will be planted to prairie after sericea lespedeza has been controlled. Access to the unit is generally good, with Kennedy Street forming the south boundary, 160th Avenue at the northwest corner, and the campground access road leading into the interior. Hickory Ridge Unit is bordered on the east by Lake Red Rock and to the west by pasture and row crop fields on adjacent private lands. There have been tree plantations established in old fields, and volunteer growth in other locations has a heavy infestation of exotic, alien woody shrubs. The area was recorded historically in the GLO notes and Andreas Atlas as prairie, although it was more likely savanna, as the large open grown oaks evident in the 1930's air photo and currently present would imply. One threatened plant species, oval ladies tresses, was recorded in 2010. The ESA is divided into two sections (12 and 6.7 acres), located along ridge tops west of the present day lake shore. Continued clearing of invasive understory brush in the densely wooded sections, as well as frequent controlled burns in these areas, will help achieve ecosystem management goals of restoring presettlement landscape conditions.

Hickory Ridge ESA (16.8 acres) This is a large tract of quality oak-hickory forest that was likely never completely cut and has excellent oak woodland and savanna restoration potential. This ESA, acquired by the USACE in 2011 has numerous large shagbark hickory trees and savanna structured white oaks. It is arguably perhaps the best potential savannas on the project. Several large oaks are multi-stemmed, indicating selective logging in the past. Cool season grass openings present in the forest are associated with a former campground on the site (old roads and cabin sites). Management efforts should include the removal of invasive trees and shrubs. Frequent controlled burns will be needed to return this habitat to presettlement conditions.

31. Cordova Unit (494.3acres; 383 acres above 774 elevation) The Cordova Unit was named for the unincorporated village of Cordova, platted by the Wabash Railroad in 1887, and was located within the flood pool of Lake Red Rock. Originally recorded as woodland in both the GLO notes and Andreas Atlas, the unit shows characteristics of savanna and prairie, too. 1930's air photos show a patchwork of cultivated fields and tracts of scattered trees. Once acquired by the Corps, the unit was originally managed by the Iowa Conservation Commission as North Elk Rock State Park. Like its sister park across the lake, Elk Rock State Park, perhaps the most impressive feature is the beautiful sandstone bluffs along the lakeshore. The bluffs provide scenic views to the lake, and from the lake to the reddish-orange sandstone cliffs. Prairie openings and bluff top prairie remnants are located among the wooded tracts, suggesting a savanna natural heritage. Notable species include broomsedge bluestem, a species of special concern. The unit has quality interior woodland, with large shagbark hickory trees providing potential bat roosting habitat. When operated as a state park, the area was managed for day use, with many picnic areas and shelters. It later became outgranted to Marion County Conservation Board, which changed management

strategies to reflect changing recreational interests. Cabins were built, and a former water tower was converted into a lookout tower, enabling outstanding views of the Des Moines River valley and Lake Red Rock for about 50 miles. The Volksweg Trail will eventually traverse the north side of the park. A boat ramp is located toward the east. The scattered woodlands are adjacent to parkland, with good potential for larger scale management of the area for interior woodland, tallgrass prairie, and native shrubland communities. The many old fields had heavy infestation of exotic, alien shrubs, and some woodland areas are also dominated with native, invasive trees and shrubs. An extensive alien shrub removal effort was completed in 2009. The unit is bordered on the north by G-28, and the many park roads provide excellent access. Brush Creek Valley Unit is to the west; Robert's Creek Recreation Unit is to the east. Management strategies to remove exotic and native successional species should be employed. The cliff prairies could be expanded and maintained, increasing prairie diversity. The unit was to be the home of the Cordova Center, and Marion CCB plans to establish an interpretive center sometime in the future. The unit has three identified Environmentally Sensitive Areas.

E Cordova ESA (13.9 acres) This woodland tract has some sections that are moderately open; likely previously pastured. The site is adjacent to the lake with scenic vistas and potential for oak savanna restoration. Currently the area has an oak and hickory composition, with several savanna structured white oak trees. However, invasive/weedy trees make up major components of the stand, a characteristic of old pasture tree growth. This increase of weedy tree species has caused shade pruning of the savanna oaks. Recent survey notes indicate some native prairie/savanna species still present along the lake edge, such as boneset, goldenrods, Virginia wild rye, including a threatened species, oval ladies' tresses. Management efforts to restore the oak savanna community should include frequent fall burns and removal of invasive trees and shrubs.

Cordova Cliffs ESA (22.2 acres) The cliffs is an area of tall multicolored sandstone bluffs and scenic vistas, with good potential for prairie and oak savanna restoration. This site was apparently not cleared or cultivated since the time of settlement. The site was recorded as forested in GLO notes and the 1875 Andreas Atlas. Currently, remnant prairie species (little bluestem, rough blazing star, lead plant, round-headed bushclover) are found along the bluffs near the lake. Savanna structured white oaks can be found along the shore edge, with shade pruned large white oaks in the forest interior. Other dominant tree species include large to pole sized walnut, red oak, hickory, hackberry, and basswood. Prescriptions to eliminate shade tolerant invasives and restore a prairie-savanna environment should be pursued.

W Cordova ESA (3.2 acres) This area is an old field site with scenic vistas and a rocky sandstone shoreline. The area was intensely pastured historically, with the northern border likely row cropped. Although ground cover at this site is primarily weedy herbaceous species and invasive shrubs (autumn olive and honeysuckle), there are a few remnant prairie species, including gray headed coneflower, black-eyed Susan, blue vervain, goldenrod. Scattered large white oaks are present near the lakeshore and good potential exists for bluff prairie and oak savanna restoration. Management efforts to clear invasive trees and understory brush, as well as frequent controlled burns, will help achieve ecosystem management goals of restoring presettlement landscape conditions.



32. Painted Rocks/Red Rock Unit (193.0 acres, 62.1 acres above 774 elevation) Painted Rocks/Red Rock Unit is named after the town of Red Rock, which lies in the flood pool below the unit, and for the current housing association with residences above the sandstone bluffs, which were referred to as “painted rocks” by the Native America Indians. The unit has unique sandstone bluffs with remnant prairies remaining along these bluffs, which is designated as an ESA. The other portions of the unit are old crop fields with poor vegetative quality.

Painted Rocks/Red Rock ESA (28.1 acres) A unique scenic, geologic, historical (Native American and early settlement, sandstone rock quarries from the early 1900s, and site of the “Red Rock Line”, separating Indian from European territory in the 1800s), with small remnant prairies along the bluffs. Rough blazing star, Iowa rose, a few large savanna structured white oaks, and serviceberry occur along these bluff edges. Excellent bluff prairie restoration exists along the cliffs, but difficult to manage due to close proximity of subdivision. It is an ideal location to have volunteer help in control honeysuckle along the bluffs by adjacent landowners.

33. Dunreath Unit (1997.7 acres, 1084.8 acres above 774 elevation) The Dunreath Unit is named after the town of Dunreath, which was a railroad community along the Wabash Railroad. Portions of the town and railroad currently lie in the flood pool of the lake. The unit encompasses one of the largest upland areas in the project, and is heavily used for wildlife management as such. A large bay occurs in the unit, making it a popular small boat area for recreation. The unit has the largest designated ESA on the Project, and has a unique peninsula land feature in the Lake Red Rock Project with portions of minimally disturbed woodland. A second ESA in the unit is identified in a bur oak savanna restoration potential area.

The Ridge ESA (536.1 acres) This ESA is a fairly remote area, providing a bit of a wilderness aspect in the Project. Good access with path along ridge allows for intensive wildlife and forest management possible in the ESA. The ESA geology creates a unique peninsula (largest one on the Project) into the lake, especially at higher pool levels. The west portion of the ESA likely never clear cut or row cropped, and may have a savanna potential in the more open areas (1950s photos). The ESA has quality older growth oak-hickory, but dense areas of invasive plant species in the old field portions of the ESA. Broomsedge bluestem, a species of special concern, was identified in 2006 along the bluffs of the ESA. Potential remnant prairie restoration exists along the south facing lakeshore cliffs where tree canopy is not entirely closed. Management strategies should include improving the woodland composition to native and desired tree species (e.g., oak and hickory), and maintaining the opening on top of the ridge to native prairie and wildlife brooding and browsing habitat. Currently a primitive road runs the length of the peninsula and several open areas are in agricultural lease.

East Dunreath ESA (32.4 acres) This ESA has a unique stand of larger old growth savanna bur oaks with a few smaller swamp and white oaks. The majority of ESA was never row-cropped and has excellent bur oak savanna potential. Several invasive and weedy plant species occur (e.g. honey suckle and honey locust), and need removed before the savanna species are lost due to competition. A western portion of the ESA has excellent savanna creation potential with smaller oak trees occurring in an old field. This ESA should be managed as a savanna, restoring the current savanna, and creating a new savanna in areas with bur oak saplings.

34. Walnut Creek Unit (2,840.1 acres, 151.2 acres above 774 elevation) This unit is named after the creek that runs through the unit into Lake Red Rock. This large unit is comprised of predominately bottomland in the lake flood pool with upland areas on the north portion of the unit used heavily for wildlife management. An upland portion of the unit is a popular location for dog trials, as well as for hunting. A 938 acre inviolate waterfowl refuge (Percy Refuge) occurs in the floodplain areas of the unit. A very popular boat ramp (Box Cars) occurs in unit, and is heavily used by waterfowl hunters in the fall. The unit has one ESA on an upland ridge referred to as the Walnut Creek Ridge ESA.

Walnut Creek Ridge ESA (27.9 acres) This ESA is unique upland peninsula and ridgetop formation occurs where Walnut Creek joins up with the Des Moines River floodplain bottoms. This small ridge is surrounded with high lake levels, creating a small peninsula into the lake, and provides an upland area even during high lake pool. The ESA has remnant prairie and bur oak restoration potential. The remnant prairie portion of the ESA has dense woody growth encroachment in need of clearing. Portions of the ESA also have large savanna bur oaks giving the ESA savanna restoration potential. Several Kentucky coffee trees occur in one section of the ESA, which is a unique tree species on the project area. A portion of the ESA is a reconstructed prairie, with good native grass composition, but also has woody growth encroaching on the prairie. Restoring the remnant prairies and bur oak savanna should be the highest priority at this site, but the reconstructed prairie should also be maintained with prescribed fire.

35. Bennington Bottoms Unit (1,459.3 acres, 151.2 acres above 774 elevation) The Bennington Bottoms Unit is named after the town of Bennington, which occurred along the Des Moines River, which is now in the flood pool of Lake Red Rock. This unit is predominately in the flood pool of the lake, with only 10% of the unit above the potential lake pool. The unit has the only island in the project area above the dam, which is surrounded year-round by the Des Moines River. The unit has a popular boat ramp on the Des Moines River, Bennington ramp, which is heavily used by waterfowl hunters in the fall, and anglers throughout the year. One upland ESA designated area occurs with older growth oak-hickory woodland that was never row-cropped.

Bennington Woods ESA (41.8 acres) Portions of the ESA have never been row-cropped, and have older growth savanna structured white oak and shagbark hickory trees, with savanna indicative species occurring (e.g., bottlebrush grass). The canopy of the ESA was fairly open yet in 1990s, allowing for excellent savanna restoration potential. Moderate density of invasive species occur (e.g., honeysuckle) and undesired species (e.g., honey locust), and will need to be removed in the savanna restoration process. Efforts in habitat restoration should focus on the older growth woodland, where oak trees are being choked out by more aggressive, shade-tolerant tree species.

36. Runnells Bottoms Unit (3,390.2 acres, 169.8 acres above 774 elevation) The town of Runnells overlooks this unit from the north. Only 5% of this unit resides out of the flood pool of the lake. large (550 acre) marsh controlled by water structures occurs in this unit It is the only managed marsh at Red Rock that using a naturally fed stream to fill and is not pumped. The majority of the rest of the floodplain is cropped when conditions allow. The small upland areas are old farm fields and pastures that have predominately vegetated to invasive trees and shrubs. No ESAs are designated for this unit.



37. Adelphi Bottoms Unit (786.8 acres, 16.4 acres above 774 elevation) The small community of Adelphi occurs north of this unit, giving the name for the unit. A mere 2% of this unit is out of the floodpool of the lake, and is predominately wooded floodplain with a few areas row cropped when conditions allow. The unit is broken into 3 separate sections, with difficult access to all three of them. The only access to two of these portions by the public is by boat on the Des Moines River. Management of this unit is minimal, with potential forested floodplain management, or keeping areas open for agriculture and wildlife food plots.

38. Middle River Unit (1,422.4 acres, 191.4 acres above 774 elevation) This unit is named after the Middle River, which flows through the unit and connects to the Des Moines River. The unit consists predominately of forested bottomland with a few cropped areas where conditions allow. The unit has one managed wetland area for waterfowl management, referred to as Little Hartford Marsh. This has been a popular hunting marsh until recent history due to the incapacity of the dike to hold water during pumping activity. The unit has one ESA in an upland area overlooking the unit.

Middle River ESA (55.7 acres) ESA is a unique area overlooking the river confluences of the Des Moines and Middle Rivers on high bluffs with extremely steep banks and deep cut ravine bisecting ESA. Sandy soils occur in ESA with sandstone rocks sloughing off steep, highly erodible banks. Area was not row cropped, and has quality oak/hickory woodland with savanna structured trees to tall, straight trees. The historic Hartford Oak was in this ESA, which was 431 year old when it fell. The ESA was reported as an important Bald Eagle night roosting location in the 1990s. The steep banks of the ESA have resulted in minimal disturbance in the past, and have maintained the quality of the site. The ESA overlooks the confluence of Middle and Des Moines Rivers. This quality ESA needs to be maintained as such, with the removal of invasive trees.

39. South River Unit (3,779.8 acres, 646.1 acres above 774 elevation) The South River flows through the entire the unit from south to north, creating a large riparian corridor for the South River. In addition to the USACE-owned lands, the DNR manages another 1,642 acres, which is predominately in WRP. Several of flood pool areas on the south end are managed as native grassland and wildlife food plots, and have good pheasant and bobwhite quail populations in these areas, with active hunter use. A very popular waterfowl hunting marsh, Richard's Marsh, occurs on the north end of the unit. The 475 acre marsh is filled by pumping in the fall and is adjacent to the Des Moines River, and is heavily used by hunters. There are no identified ESAs in this unit.

40. Swan Bottoms Unit (4,740.8 acres, 549.5 acres above 774 elevation) This is the largest unit in Lake Red, with large expanses of very low flat land used for agricultural purposes when conditions allow. The largest waterfowl refuge also occurs in this unit (1,380 acres), with large waterfowl food plots left in the refuge from the agricultural activity. The town of Swan is adjacent to the refuge along the south border. Much of the unit is not farmable due to very wet conditions, and is dominated by smartweed. A few upland areas occur along the south perimeter, overlooking the unit floodplain. Most of the upland areas in the unit were cleared for agriculture in the past with a few areas that remained wooded, as can be found in the one ESA of the unit.

Sugar Creek ESA (88.9 acres) This ESA is named after Sugar Creek which runs adjacent to the ESA along the western border. The ESA is old growth quality oak woodland with minimal disturbance in portions of the ESA, with numerous mature, large red and white oaks scattered throughout ESA. Several lepidodendron scale tree fossils are found in the ESA, with deep dissecting ravines with exposed coal outcroppings, making access difficult to most of the ESA. The ESA is best managed as an interior oak-maple-basswood forest, as it already has these tree species that are large, tall and straight in the ESA with a closed canopy.

41. Wild Cat Creek Unit (1907.1 acres, 331.2 acres above 774 elevation) The unit is named after Wild Cat Creek that runs through the middle of the unit from the south. The majority of this unit is below 774 elevation with large portions as mud flats at low elevation (743 ft). The majority of the upland areas were cleared for agricultural purposes in the past, and areas that not currently in agricultural are old fields, dominated by invasive woody growth (e.g., honey locust, elm, honeysuckle). The unit has several locations suitable for tree plantings, to help restore the unit back to the predominately wooded pre-settlement conditions.

42. Sand Hill Bluffs Unit (335.0 acres, 270.5 acres above 774 elevation) This unit is predominately above the flood pool of the lake, and soils are comprised of mostly sand along the banks and hilltop. The sandy banks create the largest natural sand beach at Lake Red Rock. The unit has steep banks (vertical at several portions) along the lake, with dominantly older growth woodland of black maple, red oak, and basswood. A few agricultural fields are still used, with the largest one recently planting in native sand prairie mix (field is predominately sand). The unit is one of the largest upland contiguous tracts of old growth forest and has the highest elevation in the Lake Red Rock Project.

Sand Hill ESA (150.5 acres) This ESA is named after the very sandy conditions of the site, and is a large tract of quality woodland and small remnant sand prairie with prairie restoration potential. High bluffs with large sandstone rock outcroppings occur along the lake. Carvings in the sandstone are present from 1932. A threatened species (slim-leaved panic grass, 1982) and a species of special concern (glomerate sedge, 1956) was recorded in ESA. Butternut, Kentucky coffee tree, showy orchid, and 92 plant species have also been recorded in the sand prairies. The ESA is also reported as an important Bald Eagle night roosting location. This ESA needs the remnant areas restored before they are completely lost, with the other areas managed as a closed canopy woodland, selecting for red oak, basswood, and black maple on the north facing slopes, and white oak, red oak, and walnut on the south facing slopes.

Sand Hill Cliffs ESA (6.6 acres) A narrow strip unique sandstone rock outcropping cliffs that create a sheer drop along the lakeshore is identified as the Sand Hill Cliffs. It is the highest vertical sheer drop at Lake Red Rock, and has very unique geological formations, which produces cool damp areas that support unique plant species. The portion of the ESA along the cliffs of the lake has had minimal disturbance in the past due the steep banks, which is evident by the vegetative composition. Care should be taken in maintaining minimal disturbance of this ESA and removing invasive plant species such as honeysuckle.



The Primary Invasive Plant Species at Lake Red Rock

Goal:

- Eliminate invasive species within ESAs & other Important Natural Resource Areas

AUTUMN OLIVE

Eleangus umbellate



Autumn Olive is a large shrub that was widely planted in the 1970s and 1980s as a wildlife food planting on public ground. Today these bushes have been dispersed around the lake invading native prairies, woodlands, oak savannas and open areas that are not routinely mowed. The shrub produces hundreds of fruits that are eaten by birds. Birds have distributed the seeds from the fruits around the lake.

CHINESE BUSH CLOVER

Lespedeza cuneata



This introduced perennial invasive and exotic legume *lespedeza cuneata*, also known as Chinese Bush Clover, is an invasive species that threatens native prairies and other open landscapes such as savanna. Once established it crowds out forage grasses and other native plants and develops extensive seed banks in the soil. Studies have shown the seeds may remain viable for 20 years or more. Left unchecked, small patches of *lespedeza cuneata* quickly spread into larger, more difficult and expensive-to-manage infestations.

HONEYSUCKLE

Lonicera sp.



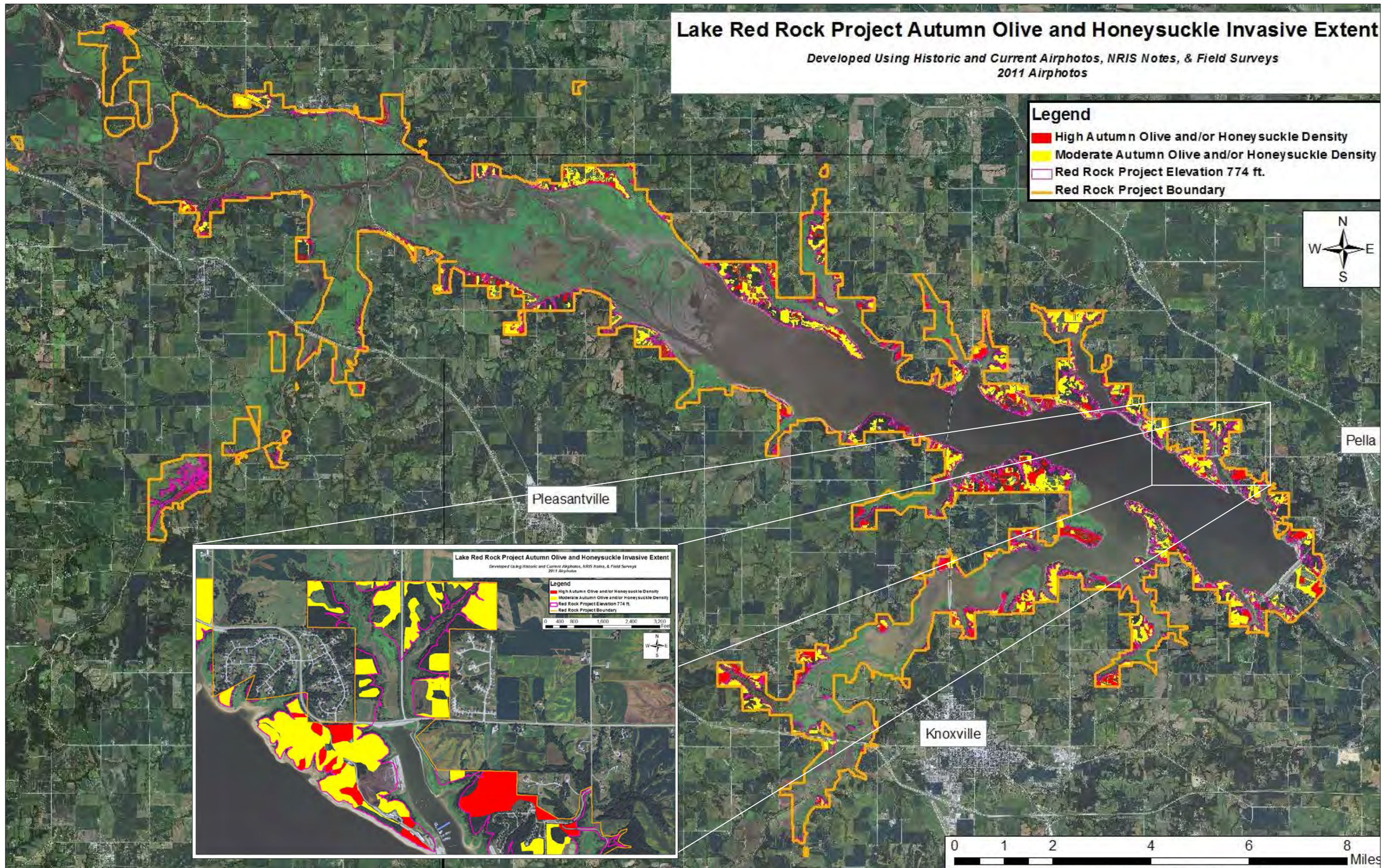
Honeysuckle was introduced to Iowa and is a prolific invasive species that shades out other native, herbaceous plants from the forest floor. Honeysuckle can rapidly invade and overtake a site, forming a dense shrub layer that crowds and shades out native plant species. It alters habitats by decreasing light availability, by depleting soil moisture and nutrients, and possibly by releasing toxic chemicals that prevent other plant species from growing in the vicinity.

There are many other invasive species that threaten Environmental Sensitive Areas and Important Natural Resource Areas at Lake Red Rock including: Asian Carp, gypsy moth, emerald ash borer, zebra mussels, and many more.

Distribution of Invasive Autumn Olive and Honeysuckle at Lake Red Rock



US Army Corps
of Engineers
Rock Island District





Fisheries

Goal:

- **Improve Fisheries**

Thousands of people fish at Red Rock every year, either on the lake or in the tailwater areas below the dam. The tailwater areas is regarded as one of Iowa’s top fisheries. This is a huge draw for recreational anglers and a positive impact for tourism in the area economy.

Lake Red Rock primarily serves as a flood control reservoir. Because of this, the fluctuating water levels rarely provide conditions to support submergent plant growth beneficial for fish fry or fingerlings. Reservoir fluctuations can also disrupt fish spawning and nests in the spring. This is a substantial challenge as fish spawn during the primary flood season in Iowa.

The Iowa DNR regularly stocks thousands of fry into the lake. Studies have indicated that only about 1% of fry will survive to a catchable size. However, fingerlings have a significantly higher survival rate at over 30%. The idea to establish fish rearing ponds at Red Rock had been discussed with anglers and the DNR for several years. A Concept Planning Charter (CPC) team was formed with the DNR, Marion County Conservation Board, Central Iowa Anglers, Mid Iowa Bass Masters and the Red Rock Lake Association to examine potential fish rearing pond locations. The committee considered many locations, and the most practical location for the first rearing pond was determined to be the former Wallashuck sewage treatment lagoon. Plans were developed for construction and management largely through various partnerships and grants. The CPC charter is included in Appendix B.

The CPC further determined that a total of 10 acres of fish rearing ponds at Red Rock would be ideal. Once the Wallashuck Ponds have been operated successfully, the Corps will assess the need and capability for additional rearing ponds.

During the reservoir drawdown in 2010 the Corps and the DNR constructed rock reef fish structures near the marina and Whitebreast Recreation Area. Fish are attracted to these structures in an otherwise relatively featureless lake basin.

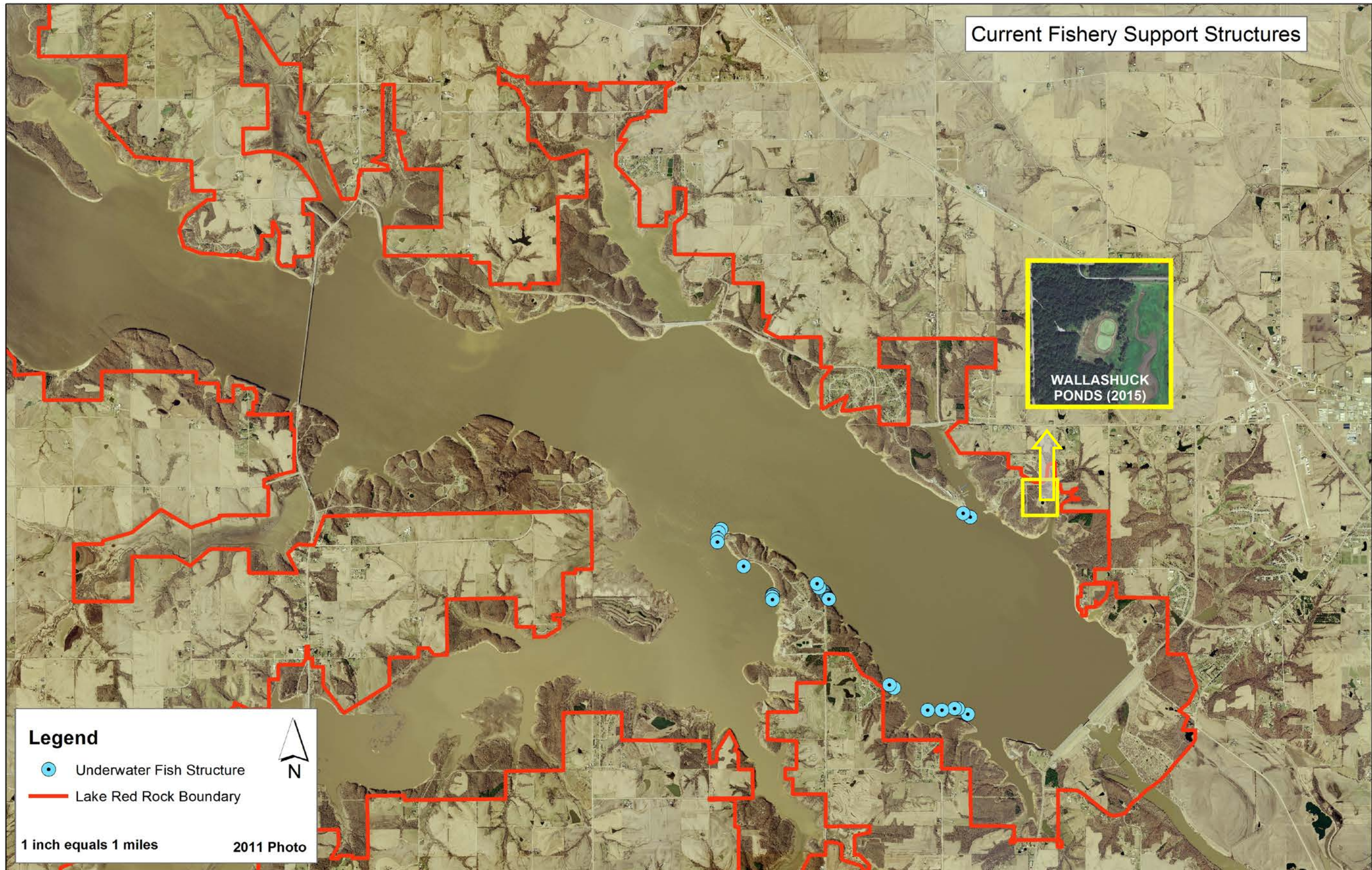
Additional efforts to improve the lake’s fisheries should be pursued as feasible.



Fish Rearing Ponds and Structures



US Army Corps
of Engineers
Rock Island District



CHAPTER 3 Sustainable Environment

Red Rock
Project

Master Plan
2015



Hunting

Goal:

- **Maintain 95% of current public hunting acreage. Total hunting acreage currently at Red Rock Project is 44,507**

Hunting in America has been a national pastime since settlement, and for Native Americans who had no domestic livestock for meat, it was a way of life. These traditions live on in modern American culture, but land use pressures can make the free exercise of this pursuit difficult.

One key element for wildlife and good hunting is suitable habitat. Iowa is blessed with very productive soils and excellent wildlife habitat, but “unimproved” land provides little economic return. As a consequence, wildlife habitat and hunting opportunities are proportionately very scarce in Iowa due to habitat loss. Huntible natural areas exist on private lands, but as time passes these areas have decreased, and in some situations, privately owned land is not available to the general public for hunting. Only about 2% of Iowa is publicly owned, and some of this is reserved for parks or wildlife refuges, where hunting is not allowed.

This situation reveals the importance of preserving public hunting acres for proper wildlife management, and the enjoyment by current and future generations. This reality has environmental implications and economic implications as well. But perhaps more importantly is the human element—public lands are places to connect with nature, where people can hunt as peoples have for generations, and this pursuit is good for families, friendships and personal health.

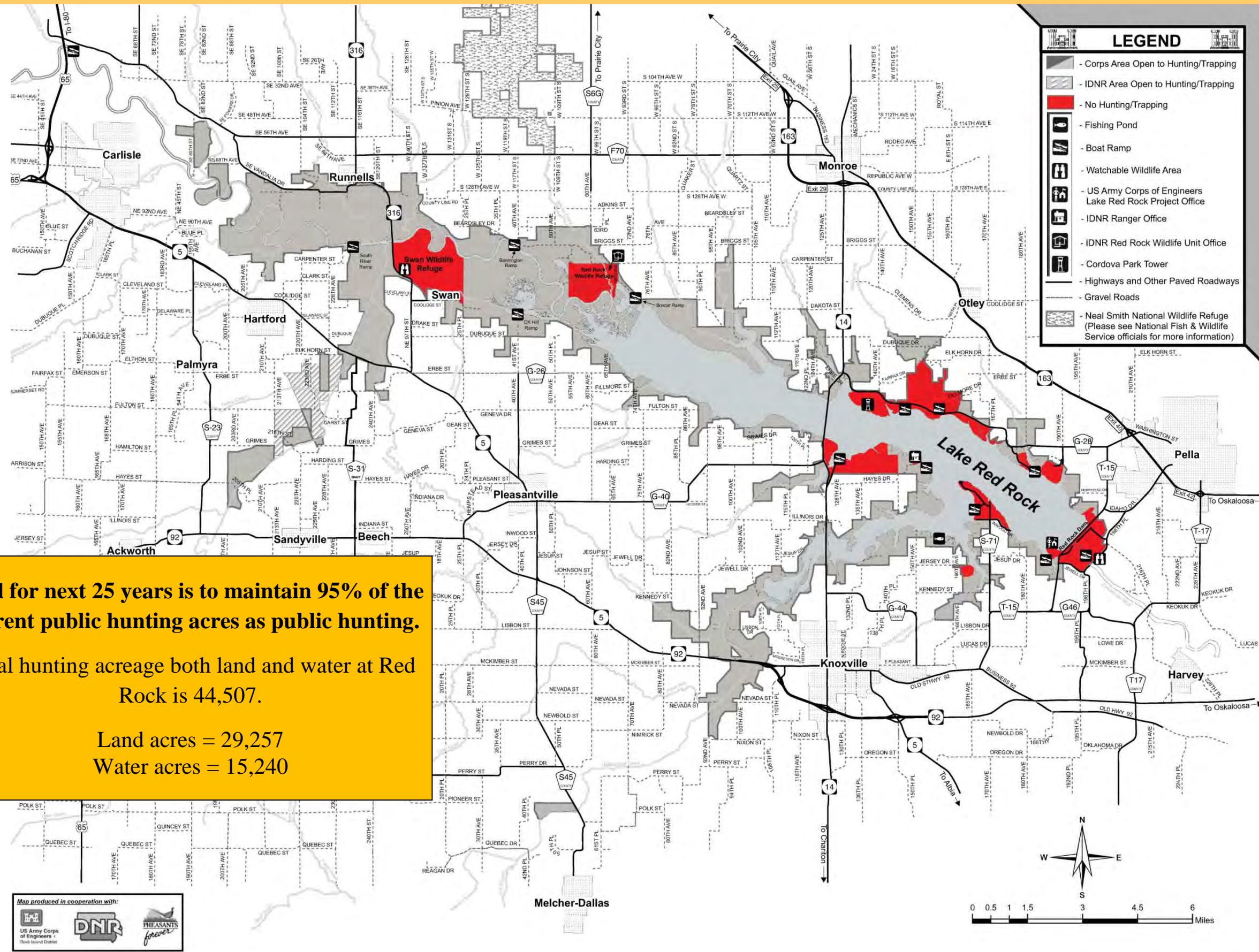
Hunting is an important tool that is integral for wildlife management. In the years following settlement, large predators were extirpated, leaving only human intervention as a means to control populations of certain species, such as white-tailed deer. If left unchecked, populations can expand beyond the carrying capacity of the land, which can result in resource degradation, starvation and disease. Unregulated hunting and trapping in the post-settlement era also led to the near elimination of white-tailed deer, prairie chickens and otters to name a few, and extirpated species, such as wild turkeys. Wildlife management with regulated seasons and bag limits has allowed a rebound of many native wildlife species that were nearly wiped out in Iowa. Plus, introduced species like the ring-necked pheasant, can thrive in Iowa so long as weather and suitable habitat are available. This game bird co-exists with native wildlife and offers a great renewable resource, recreational hunting opportunity, spurs tourism, and a delicious fare for the table.

It is important to note that the purpose of this goal is not to reduce public hunting acreage, but to maintain it. Hopefully, 100% of current public hunting acreage will remain available. However, it may be necessary to reduce available acres due to unforeseen reasons. One reason huntible acres may be reduced is future establishment of temporary or permanent wildlife refuges if needed to protect or restore wildlife populations.





Public Hunting Areas as of 2015



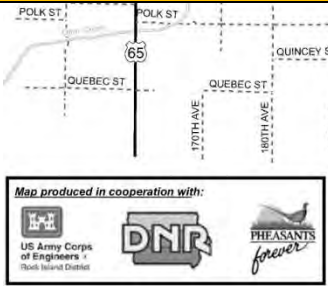
LEGEND

- Corps Area Open to Hunting/Trapping
- IDNR Area Open to Hunting/Trapping
- No Hunting/Trapping
- Fishing Pond
- Boat Ramp
- Watchable Wildlife Area
- US Army Corps of Engineers Lake Red Rock Project Office
- IDNR Ranger Office
- IDNR Red Rock Wildlife Unit Office
- Cordova Park Tower
- Highways and Other Paved Roadways
- Gravel Roads
- Neal Smith National Wildlife Refuge (Please see National Fish & Wildlife Service officials for more information)

Goal for next 25 years is to maintain 95% of the current public hunting acres as public hunting.

Total hunting acreage both land and water at Red Rock is 44,507.

Land acres = 29,257
Water acres = 15,240



A Natural Place to Play

- Maintain & expand existing water based recreation opportunities to meet public desire within carrying capacity
- Develop low impact, active resource based recreation opportunities
- Develop unique recreation opportunities that encourage respectful connection to the Environment



A Natural Place to Play

Over 600,000 people visit Lake Red Rock each year. Activities include boating, camping, picnicking, hiking, biking, horseback riding, and bird watching – Lake Red Rock provides it all!

Public comment has indicated that people value the natural state of Lake Red Rock. As Iowa's largest lake, Red Rock provides a multitude of recreational opportunities.

Recreational pursuits at Lake Red Rock provide visitors with desired amenities while maintaining a “natural feel”. The goals listed below and established under the focus area, *A Natural Place to Play* will guide and ensure recreational opportunities around Lake Red Rock continue to provide outdoor experiences that expose visitors to high valued recreation in a natural setting.

Goals:

- Maintain & expand existing water based recreation opportunities to meet public desire within carrying capacity
- Develop low impact active resource based recreation opportunities
- Develop unique recreation opportunities that encourage respectful connection to the Environment





Maintain and Expand Recreation - Vision

Goal:

- **Maintain & Expand existing water based recreation opportunities to meet public desire within carrying capacity**

Lake Red Rock is one of the most popular recreational destinations in Iowa as over 600,000 people visit Lake Red Rock each year. Significant recreational activities at Lake Red Rock include camping, picnicking, biking, hiking, disc golf, archery, hunting, fishing, bird and wildlife watching, horseback riding, geo-caching, sightseeing, pleasure boating, water skiing and tubing, sailing, swimming, and paddle sports.

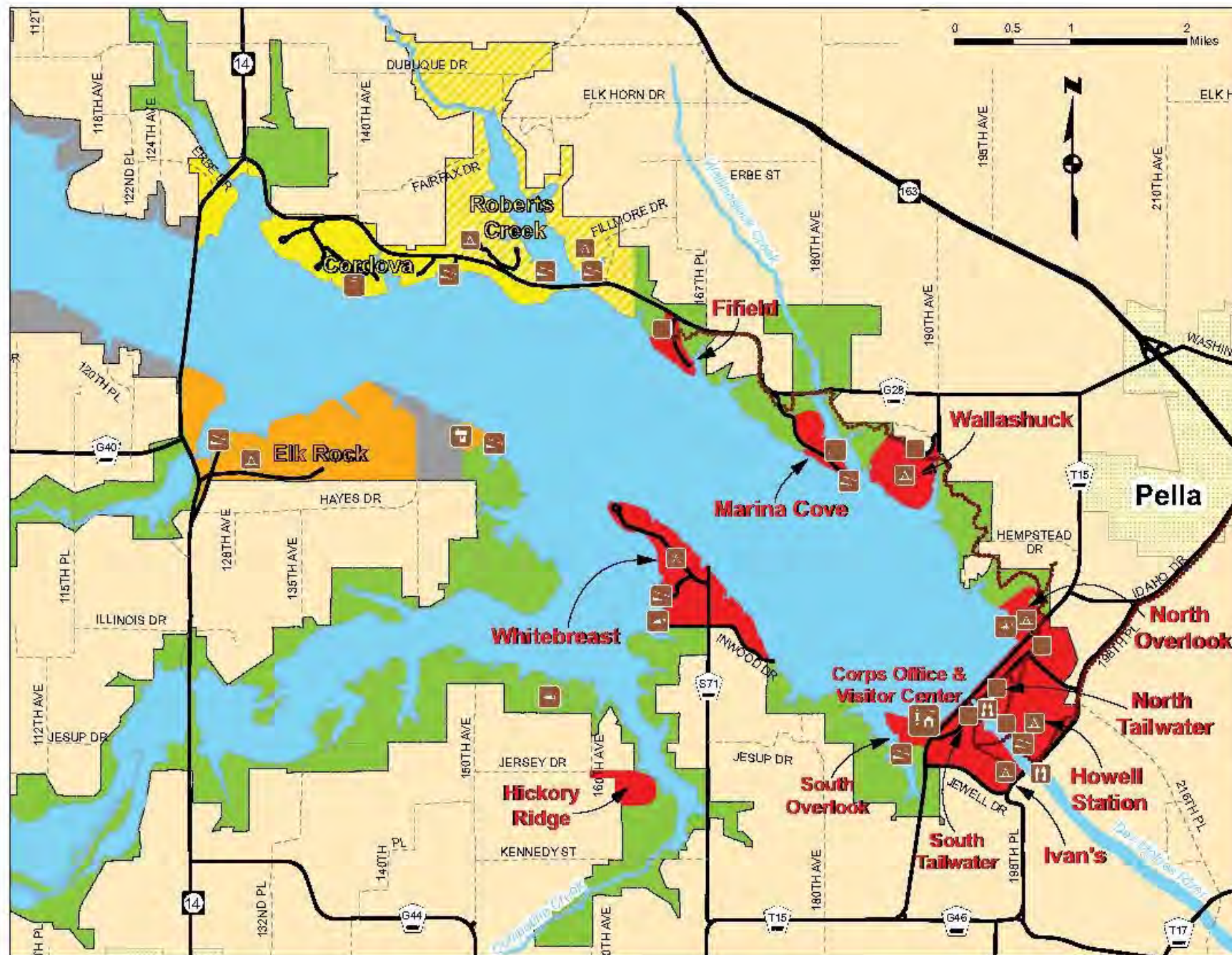
Lake Red Rock offers a number of recreation areas around the lake with a wide variety of facilities including campgrounds, day use areas, picnic areas, land access points, cabins, beaches, boat ramps, trails, an archery range, a disc golf course, and a visitor center that cater to these different types of recreational activities. These recreation areas are managed by several entities including the Corps, the Iowa DNR, and the Marion County Conservation Board (MCCB).

The management objectives for these recreation areas are to maintain and modernize the existing infrastructure while adding facilities and amenities within the existing recreation areas based on changing customer desires & recreational trends. Implementation of these objectives will be dependent upon budget, manpower, and time. The use of partnering and technological innovations will be explored whenever feasible to assist with implementing these objectives.





2015 Recreation Area Map



Welcome to Iowa's Largest Lake

Lake Red Rock has over 15,000 surface acres of water at normal conservation pool, which is 742 feet above sea level. Located on the Des Moines River just 45 miles southeast and downriver from Des Moines, the reservoir collects runoff and drainage from over 12,320 square miles of Iowa and southern Minnesota land. This protects communities and agriculture lands downstream from the Red Rock Dam. The maximum flood control pool is 780 feet above sea level, over 33 miles long, and covers 65,500 acres. Other lake area benefits include numerous recreational opportunities and natural resources on the water and surrounding public lands.

Visitor Center

The Visitor Center, located at the south end of the dam, has many interesting displays and exhibits. Local and regional camping and travel information is available.

Visitor Center Hours:

February and March	Sat./Sun.	12:00 p.m. - 4:00 p.m.
April	Sat./Sun.	9:30 a.m. - 6:00 p.m.
May	Mon./Fri.	12:00 p.m. - 4:00 p.m.
	Sat./Sun.	9:30 a.m. - 6:00 p.m.
Memorial Day - Labor Day	Everyday	9:30 a.m. - 6:00 p.m.
September and October	Sat./Sun.	9:30 a.m. - 6:00 p.m.
November	Sat./Sun.	12:00 p.m. - 4:00 p.m.

* Closed December thru January 31

Parks	Boat Ramp	Bicycle Trail	Camping	Primitive Camping	Dump Stations	Electrical Sites	Fish Cleaning Stations	Group Camp Areas	Hiking Trail	Horse Trails	Information	Rental Cabins	Marina	Picnic Areas	Playground	Restrooms	Showers	Swimming Beach	Water
Fi field	●																		
Hickory Ridge	●																		
Howell Station	●																		
Ivan's	●																		
Marina Cove	●																		
North Overlook	●																		
North Tailwater	●																		
South Overlook	●																		
South Tailwater	●																		
Wallashuck	●																		
Whitebreast	●																		
Visitor Center	●																		
Elk Rock	●																		
Cordova	●																		
Roberts Creek	●																		

To reserve a campsite at Lake Red Rock:
www.recreation.gov (Corps managed)
www.reserveiaparks.com (IDNR Managed)
 (641) 627-5507 (Roberts Creek)

Legend

Corps Recreation Area	Towns/ Cities	Campground
Other Corps Managed Lands	Gravel Roads	Marina
IDNR Recreation Area	Paved Roadways	Boat Ramp
IDNR Wildlife Management Area	Volksweg Trail	Fishing Pond
Marion County Recreation Area (Cordova Park)	US Army Corps of Engineers Lake Red Rock Project Office	Watchable Wildlife Area
Marion County Recreation Area (Robert's Creek Park)	IDNR Ranger Office	Volksweg Trailhead
	Cordova Park Tower	

Emergency/Information

All Emergency Services..... dial 911

US Army Corps of Engineers Lake Red Rock Project 1105 Hwy T15, Knoxville, IA 50138 (641) 828-7522 or (641) 628-8690 www.lakeredrock.org	Elk Rock State Park Park Ranger 811 146th Avenue Knoxville, IA 50138 (641) 842-6008 www.iowadnr.com
Roberts Creek County Park Park Ranger 1617 Fillmore Avenue Otley, IA 50214 (641) 627-5507	Cordova County Park Park Ranger County Naturalist 1378 Highway G-28 Otley, IA 50214 (641) 627-5935



The following is a synopsis of the recreation areas at Lake Red Rock Project detailing the existing amenities. The objectives for these areas are to maintain and modernize the existing infrastructure while adding facilities and amenities within the existing recreation areas based on changing customer desires & recreational trends.

Howell Station Campground: Howell Station Campground is located along the Des Moines River downstream of the Red Rock dam. It is popular with campers due to spacious campsites with mature tree shade as well as close access to shore fishing and the paved Volksweg bike trail. The campground contains 143 RV hard surface campsites with electric service. The campground also contains several amenities including 5 shower buildings, 2 playgrounds, a hiking trail, and a sewage dump station.

North Overlook Campground: North Overlook Campground is located along the north shore of Lake Red Rock. It is popular with campers due to mature tree shade as well as close access to shore fishing, the North Overlook Beach, and the paved Volksweg bike trail. The campground contains 46 RV hard surface campsites with electric service and 8 earthen tent sites without electric service. The campground also contains several amenities including a shower building, a playground, a natural playscape, and a sewage dump station.

Wallashuck Campground: Wallashuck Campground is located along the north shore of Lake Red Rock. It is popular with campers due to spacious campsites as well as close access to the paved Volksweg bike trail. The campground contains 83 RV hard surface campsites with electric service. The campground also contains several amenities for campers including 3 shower buildings, a playground, a fish cleaning station, a picnic shelter, a sewage dump station, a trailhead for the paved Volksweg bike trail, and a 1-lane high water boat ramp with a small parking lot.

Whitebreast Campground: Whitebreast Campground is located along the south side of Lake Red Rock. It is popular with campers as it has a boat ramp and is in close proximity to Whitebreast Beach. The campground contains 128 RV hard surface campsites with electric service including a group camping area with 19 RV hard surface campsites with electric service. In addition, the area has a primitive youth camp with tent sites and a vault toilet. The campground also contains several amenities including 5 shower buildings, 2 vault toilets, 2 playgrounds, a fish cleaning station, 4 picnic shelters, an amphitheater, a sewage dump station, a hiking trail, and a 3-lane boat ramp with a courtesy dock and a large parking lot.

Ivan's Campground: Ivan's Campground is located along the Des Moines River downstream of the Red Rock dam. It is popular with campers due to close access to shore fishing and the paved Volksweg bike trail. The campground contains 21 RV hard surface campsites with electric service. The campground also contains a shower building.

Fifield Recreation Area: Fifield Recreation Area is a day use area located along the north shore of Lake Red Rock. The area contains four group picnic shelters and a trailhead for the paved Volksweg bike trail. This area also contains several amenities including two restroom buildings, a playground, and several picnic sites. The shelters are popular for events such as wedding receptions and family outings. The area is often also used for shore fishing.

South Overlook Recreation Area: South Overlook Recreation Area is a day use area located along the south shore of Lake Red Rock. The area contains two group picnic shelters and a 3-lane boat ramp with a courtesy dock and a large parking lot. This area also contains several amenities

including a restroom building and a fish cleaning station. The shelters are popular for large spectator events such as large wedding receptions, car shows, and athletic events. The boat ramp is popular with boaters due to its location in a sheltered cove of the lake.

Lake Red Rock Visitor Center: The Visitor Center is a facility attached to the administration office located on the south end of the Red Rock Dam. The interior of the center contains interpretive displays on the project's three-fold missions of Flood Risk Management, Environmental Stewardship, and Recreation; restrooms, amphitheater, gift store, brochure storage; and programming storage. The amphitheater provides programming space that can accommodate approximately 40 people and is utilized for interpretive programs, staff meetings, contractor/volunteer meetings and other agency/group meetings as requested. The exterior of the center has a scenic viewing patio with interpretive panels; a bell from the town of Red Rock; Tracks ID game; and bird feeders. The patio is popular location for weddings, bird watching and sightseeing. The objective for this facility is to eventually move the Visitor Center and administration office away from the lakeside hill. Over the years the visitor center has shown some structural issues that necessitate a move to a more stable location. The new facility would provide similar, but modernized amenities to accommodate visitor demands and changes in interpretive programming trends.

South Tailwater Recreation Area: South Tailwater Recreation Area is a day use area located along the Des Moines River downstream of the Lake Red Rock dam. The area provides two group picnic shelters, two fish cleaning stations and a trailhead for the paved Volksweg bike trail. This area also contains several amenities including a restroom building, a playground, and several picnic sites. The area is very popular with anglers, picnickers, and trail users.

North Tailwater Recreation Area: North Tailwater Recreation Area is a day use area located along the Des Moines River downstream of the Lake Red Rock dam. The area provides two group picnic shelters, a fish cleaning station and a trailhead for the paved Volksweg bike trail. This area also contains several amenities including a restroom building, a playground, and several picnic sites. The area is very popular with anglers, picnickers, and trail users.

Howell Station Landing Recreation Area: Howell Station Landing Recreation Area is a day use area located along the Des Moines River downstream of the Lake Red Rock dam. The area provides a fish cleaning station, a trailhead for the paved Volksweg bike trail, and a 1-lane boat ramp with a small parking lot that accesses the Des Moines River. This area also contains several amenities including a vault toilet and several picnic sites. The area is very popular with anglers, picnickers, and trail users.

Marina Cove Recreation Area: Marina Cove Recreation Area is a day use area located along the north shore of the Lake Red Rock. The area contains a 2-lane boat ramp with a courtesy dock and a moderate sized parking lot. This area also contains several amenities including a restroom building. The boat ramp is popular with boaters due to its location adjacent to the Red Rock Marina concession.

North Overlook Beach: North Overlook Beach is a day use area located along the north shore of Lake Red Rock. The beach is usable at high lake elevations. The area contains a shower building, a concession building with restroom facilities, outdoor showers, two volleyball courts, several picnic sites, and a large parking lot. The area is popular with beach users due to the fact that it is usable at high lake elevations and because it has boat parking available along the shoreline adjacent the beach.

Whitebreast Beach: Whitebreast Beach is a day use area located along the south shore of Lake Red Rock. The area contains a shower building, outdoor showers, several picnic sites, and an enclosed



shelter with kitchen and restroom facilities. The area is popular with beach users due to the fact that it is adjacent Whitebreast Campground and boat ramp and because it has boat parking available along the shoreline adjacent the beach.

North Overlook Picnic Area: North Overlook Picnic Area is a day use area located along the north side of Lake Red Rock. The area contains a group picnic shelter and a trailhead for the paved Volksweg bike trail with a large parking lot. This area also contains several amenities including a restroom building, a hiking trail, and several picnic sites. The shelter is popular for events such as wedding receptions and family outings. The trailhead is heavily utilized by trail users.

Red Rock Archery Range: The Red Rock Archery Range is located along the south shore of Lake Red Rock. The archery range contains three trails with approximately 60 shooting lanes, a practice shooting range, and a picnic shelter. The area is popular for group archery competitions. Potential future development for this area can be found in the Red Rock Archery Range concept plan section of this Master Plan.

Hickory Ridge Wilderness Campground: Hickory Ridge Wilderness Campground is located along the south shore of Lake Red Rock. It is a paddle-in/hike-in campground with 8 primitive earthen tent sites, a canoe/kayak landing, and a picnic shelter that is nestled in approx. 50 acres of timber predominately populated by oak and hickory trees. Future development for this area includes installation of a vault toilet and potable water.

OUTGRANTED AREAS:

Elk Rock: Elk Rock is an outgrant area managed by the Iowa DNR located on the south side of Lake Red Rock. The area has a campground, a large six-lane high water boat ramp that accesses Lake Red Rock, a smaller one-lane boat ramp that accesses Lake Red Rock, and a 13 mile equestrian trail system. The campground contains 57 equestrian campsites, 12 RV campsites with electric service, and 18 tent sites without electric service. The campground also contains several amenities including two shower buildings, two playgrounds, a dump station, and an equestrian riding arena and covered hitching rails. The campground & riding trails receive heavy equestrian use. The high water boat ramp contains a vault toilet, a courtesy dock, and a large parking lot. The high water boat ramp is one of the most heavily utilized ramps on the lake.

Robert's Creek: Robert's Creek is an outgrant area managed by the MCCB, located on the north side of Lake Red Rock. The area has two campgrounds, a section of the paved Volksweg bike trail, the Robert's Creek sub-impoundment body of water, and 2 one-lane boat ramps that access the Robert's Creek sub-impoundment. The Robert's Creek East campground contains 50 RV hard surface campsites with electric service and a 9 hole disc golf course. The campground also contains several amenities including a shower building, a restroom building, a playground, a sewage dump station, and several picnic sites. The Robert's Creek West Campground contains 81 RV hard surface campsites with electric service including 40 full service campsites with water and sewer service in addition to electric service. The campground also contains several amenities including a shower building, a restroom building, three vault toilets, a playground, a sewage dump station, two picnic shelters, and several picnic sites. The West Campground is popular among campers due to the full service sites and mature tree shade. The Robert's Creek area also contains an old archery range that will eventually be re-purposed for other recreational uses.

Cordova Park: Cordova Park is an outgrant area managed by the MCCB located on the north side of Lake Red Rock. The area has two cabin areas, the westernmost trailhead for the paved Volksweg bike trail, a section of the paved Volksweg bike trail, and a two-lane boat ramp that accesses Lake Red Rock and a day use area that features a large 110'x70' pavilion picnic shelter and a 106 ft tall observation tower. In addition to the large pavilion picnic shelter and the observation tower, the day use area also contains 3 restrooms, 3 picnic shelters, a playground, an earthen hiking trail, and several picnic sites. The large pavilion picnic shelter and the observation tower are heavily utilized. The two cabin areas contain 7 modern cabins, the boat ramp contains a moderate sized parking lot and a picnic shelter, and the trailhead contains a vault toilet, a picnic shelter, and a large parking lot. The two cabin areas are heavily utilized throughout the year.





Marina Concession and Development

Goal:

- **Maintain & expand existing water based recreation opportunities to meet public desire within carrying capacity**

During the master planning process various stakeholders stated that future development at the marina site at Lake Red Rock should be addressed. The existing marina facilities at Lake Red Rock are located adjacent to the Marina Cove Boat Ramp and include the following: docks with approximately 120 boat slips, on water fueling station, slip holder parking lots, storage buildings, on land marina store, and minimal other marine service facilities.

Marina facilities on Lake Red Rock are privately owned and operated by commercial concessionaire through a lease with the Corps of Engineers. Although there has been public demand to expand facilities at the marina site, expansion has been limited due to various factors. The existing marina site is not well protected from wind and wave action, nor does it have the additional land area available for meaningful expansion of marina facilities.

Following the devastating 2008 flood, sediment was dredged from approximately 20 acres of the upper marina cove and riprap was placed on the associated shorelines for bank stabilization. The dredge material was placed on the cove's west bank in a manner that would allow for expanded marina development of land based facilities. The shoreline protection at the future development site was constructed in a manner to allow the marina to be accessible at all lake elevations and at a location better protected from wind and wave action. This would allow for expansion of water based marina facilities.

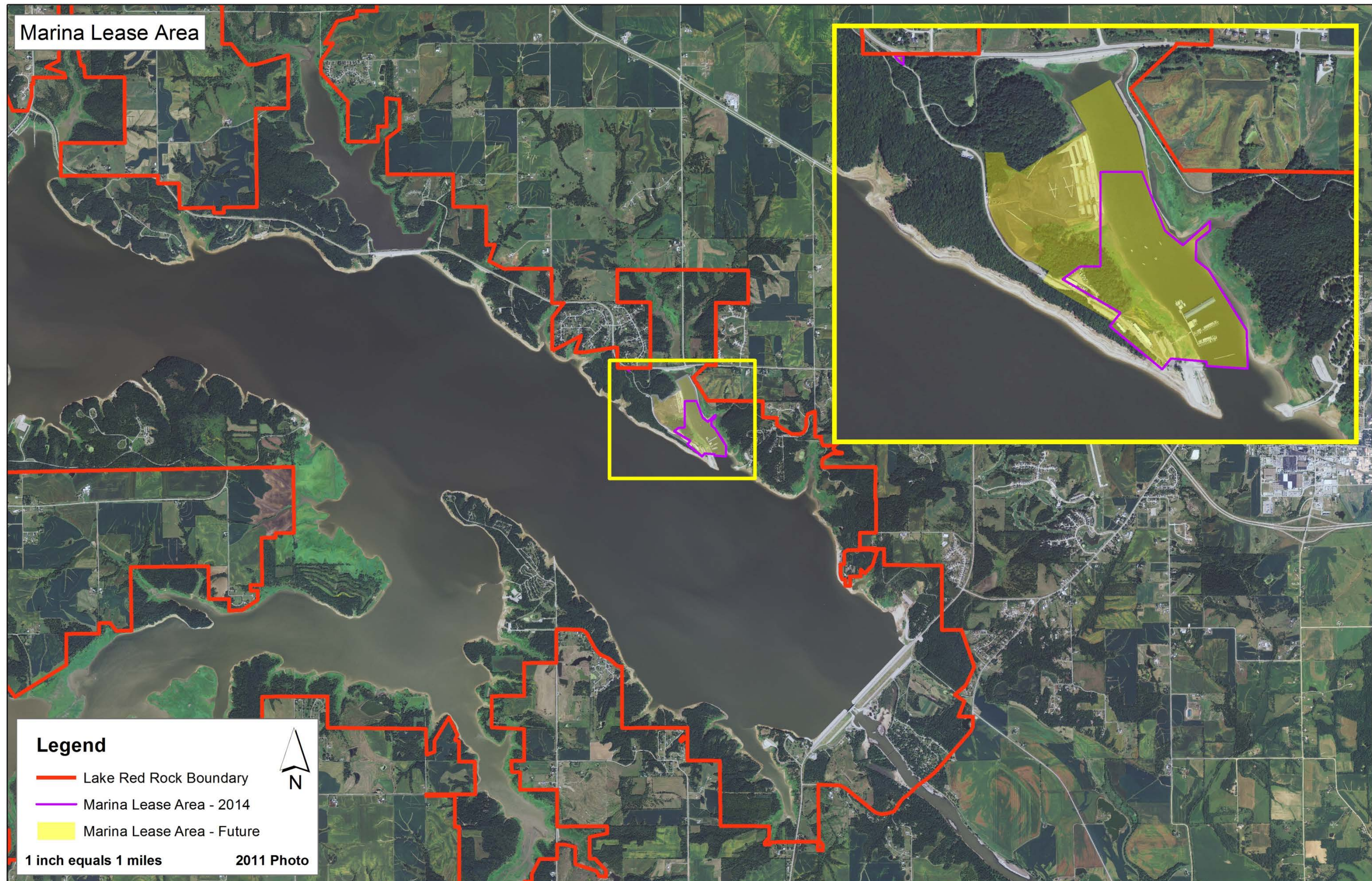
Future development of marina facilities at the new and existing marina sites will be completed by private commercial interests as approved by and through outgrant with the Corps of Engineers. In addition to infrastructure development such as utility, parking, and roadway, other future development at the marina may include expanded docks with additional boat slips, expanded marine supply retail facilities, marine service & repair facilities, expanded marine off-season storage facilities, and restaurant & lodging facilities.



Current and Potential Proposal for Future Expansion



US Army Corps
of Engineers
Rock Island District



CHAPTER 3 A Natural Place to Play

Red Rock
Project

Master Plan
2015



Volksweg Trail

Goal:

- **Maintain & expand existing water based recreation opportunities to meet public desire within carrying capacity**

The Volksweg Trail is a popular 14.5 mile multi-purpose paved trail that runs from the City of Pella to below the Red Rock Dam and then along the north side of Lake Red Rock. The Volksweg Trail, or “peoples path”, offers scenic views throughout the trail route including views of Lake Red Rock, the Des Moines River, timbered areas, restored prairies, and open fields.

In 2013, the Volksweg Trail was designated as a National Recreation Trail by the National Recreation Trails Program which is jointly administered by the National Park Service and U.S Forest Service in conjunction with a number of other federal and nonprofit partners. The National Recreation Trail designation recognizes trail systems that link communities to recreational opportunities on public lands across the nation.

Trail construction drawings and specifications are in place to extend the Volksweg Trail another 3 miles from the Cordova Trail Head to the Cordova Park area on the north side of the lake. This planned trail extension is waiting on funding before the construction work can proceed.

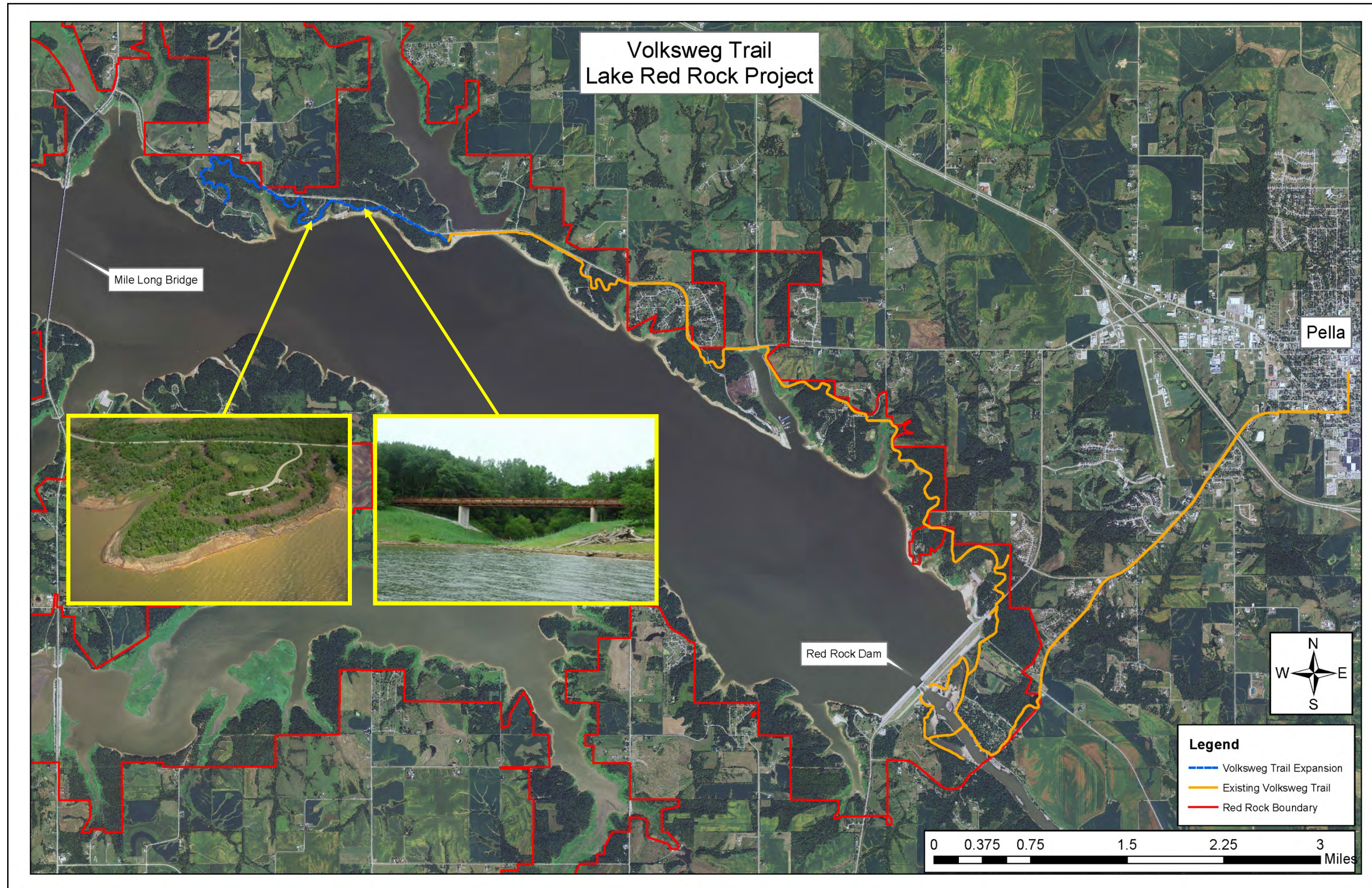
Further discussion of how this trail can connect to other areas in the region can be found in the *Connections* section of Chapter 3.



Volksweg Trail



US Army Corps
of Engineers
Rock Island District



CHAPTER 3 A Natural Place to Play

Red Rock
Project

Master Plan
2015



Water Trails Concept Planning

Goal:

- **Maintain & expand existing water based recreation opportunities to meet public desire within carrying capacity**

During the master planning process, stakeholder feedback was received that maintaining and expanding water based recreational opportunities including paddle sports should be addressed during the master plan process. Lake Red Rock currently has a 37 mile water trail designated as a National Water Trail by the National Park Service that has 8 trail access points including the Hickory Ridge paddle-in campground.

To address the stakeholder feedback received during the master planning process, Lake Red Rock Project Staff met with a group of paddle sport enthusiasts to identify potential projects for future expansion of paddle sports at the lake. The potential projects identified by the group were a portage connection from Lake Red Rock to the Des Moines River downstream of the dam, and evaluation of additional locations for paddle-in camping at Lake Red Rock. Once the potential projects were identified, the paddle sport group examined areas around the lake and proposed a location for a lake to river portage as well as a number of locations for evaluation of additional paddle-in camping.

The proposed locations for the potential future expansion projects were evaluated for location characteristics, implementation costs, operation and maintenance costs, potential user conflicts, & potential environmental impacts. A map showing the proposed lake to river portage and the proposed additional paddle-in camping locations as well as the existing water trail with access points including the Hickory Ridge paddle-in campground can be viewed on the following pages.





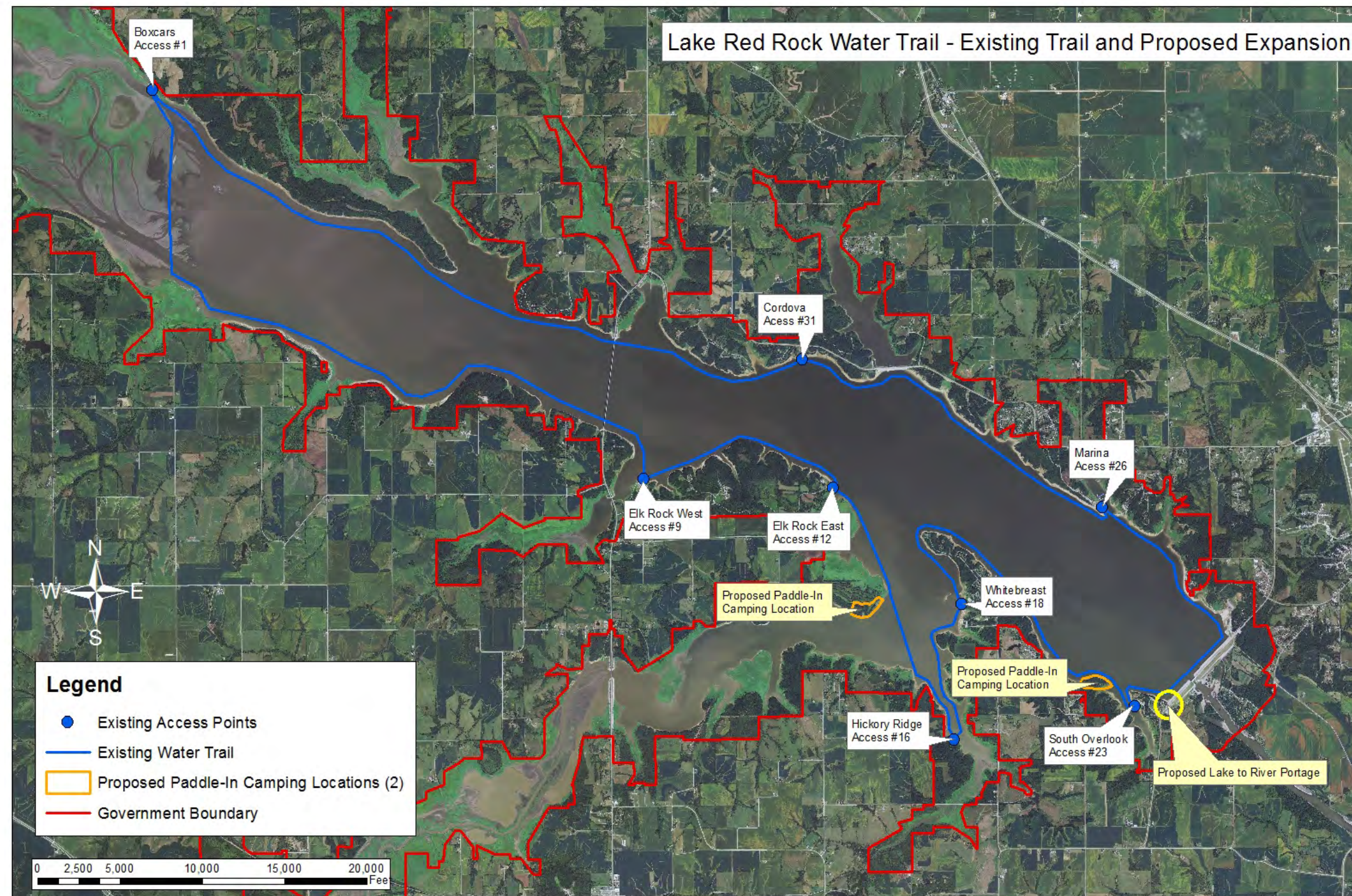
Red Rock National Water Trail



OBJECTIVE 1
Develop Lake to River portage where paddlers can park, access the lake from the Red Rock Visitor Center, load vessel and then drive below the dam to access the Des Moines River.

OBJECTIVE 2
Continue to work with Iowa Department of Natural Resources on water trail program development, ensuring cooperation between agencies.

OBJECTIVE 1
Continue to connect people to water, enabling a mindset of water conservation.



Archery Range Concept Planning

Goal:

- **Develop low impact, active resource based recreation opportunities.**

An archery range has been an active recreational opportunity at Robert’s Creek Park on the northside of Lake Red Rock for over 30 years. This archery area was negatively impacted by construction of the paved Volksweg Trail through a portion of the range reducing parking and eliminating targets in that area. Additionally, a number of shooting lanes at the range inundated with water during high lake elevations.

Archery has become a growing recreational pastime in Iowa and there are limited archery facilities on public land in Iowa. During initial master planning meetings, significant stakeholder comment was received that desired improved archery opportunities at Lake Red Rock.

To address the need to relocate the archery range, due to impact from trail construction, and stakeholder input desiring improved archery opportunities local archery enthusiasts were asked to identify an area at Lake Red Rock that would be suitable for relocation of the archery range. An existing area classified for intensive recreation known as the Elk Rock Bridge Area was identified as a prime location for the new archery range. The Bridge Area was an underutilized picnic area under Iowa DNR management.

The proposed concept plan showing the archery range at the Bridge Area was presented at the Master Plan Public Open Houses held in 2013. The proposed concept plan included four trails with approximately sixty shooting lanes, a practice range, expanded parking, and an indoor shooting range with kitchen, restroom, and storage facilities. No negative input was received on the proposed concept plan during the 2013 public open houses. Due to the positive public response received and the immediate need to relocate the archery range, the Corps allowed the initial relocation in 2014. Prior to relocation, environmental and cultural reviews were completed through the Corps NEPA process.

Trails with approx. 60 shooting lanes as well as a practice shooting range were installed and the area has already been well utilized for archery activities by the public. Potential future development may include expanded parking and an indoor shooting range with kitchen, restroom, and storage facilities as shown on the archery range concept plan.

The archery range concept plan including the potential future development can be viewed on the next page.



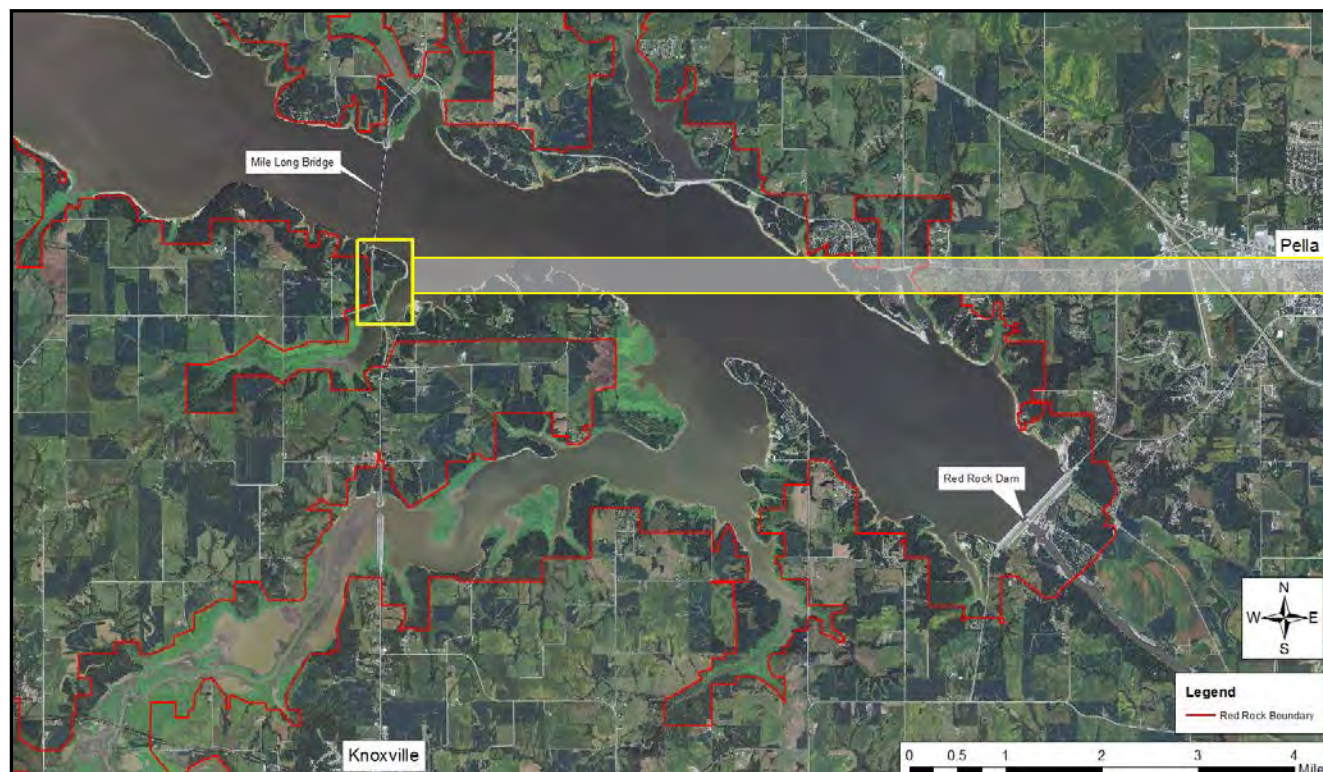


Red Rock Archery Range

Archery has become a growing recreational pastime in Iowa. Additionally, there are limited archery experiences on public land in Iowa. To the right is a conceptual plan for the Red Rock Archery Range. This preferred concept will have minimal impact to the quality natural resources of the area.

Benefits of Moving & Improving the Archery Range Include:

- Target areas will be out of flood pool at new location
- Larger area available for parking for routine and event participants
- Archery range and associated facilities are compatible with low intensity recreation designation recommended for the area. (Overnight occupancy facilities will not be permitted)
- Strong partnership potential
- Focus group input



Soft Trails Concept Planning

Goal:

- **Develop low impact, active resource based recreation opportunities.**

During initial master plan meetings, stakeholder feedback was received that expanding soft trails on public land at Lake Red Rock should be addressed during the master plan process. Soft trails are multipurpose earthen trails predominately used for mountain biking but also used for other purposes such as hiking. A Concept Planning Charter (CPC) team was formed to develop a concept plan for expanding soft trails at the lake. The finished concept plan would be included in the master plan revision. During development of the concept plan, the CPC team considered the following: trail implementation costs, trail operation and maintenance costs, trailhead locations, trailhead parking, trail amenities, potential user conflicts, and potential environmental impacts. The CPC team met monthly from January to April 2012. Their charter is included in Appendix B.

To develop the concept plan, the CPC team indentified potential locations around the lake for expanded soft trails. The CPC team evaluated the potential locations using the considerations listed above. Maps were then created to show the final proposed concept plan for expanded soft trails. The map of the proposed concept plan for expanded soft trails can be viewed on the following page.

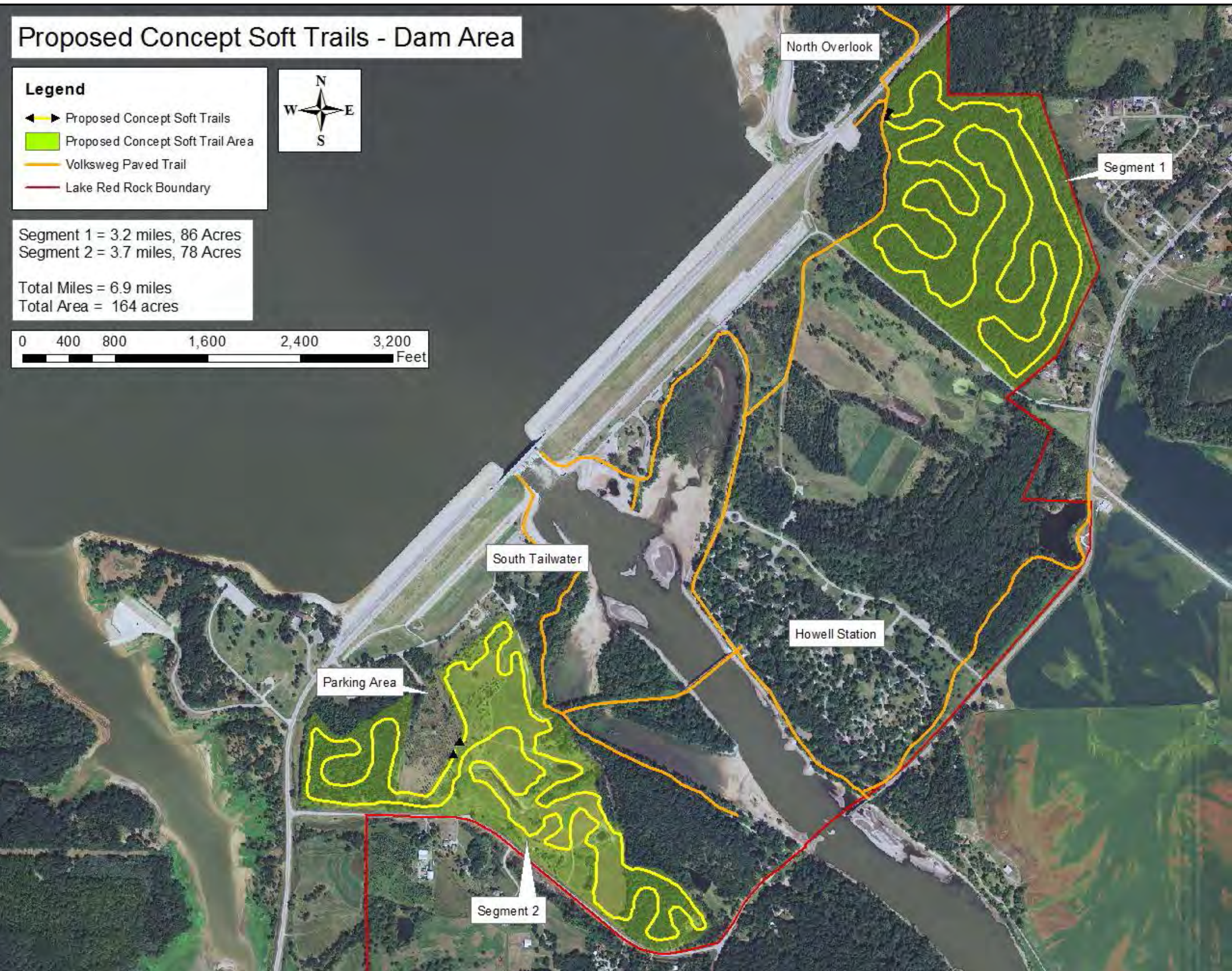
It is recognized that soft trail advocates desired development of twenty five miles or more of soft trails at Lake Red Rock in order to serve as a destination trail. If the specific soft trail concepts shown are developed and well utilized the Corps is supportive of extending the trail along the southside of Lake Red Rock. The exact route will need to be carefully planned to minimize impact, but in general a soft trail is considered compatible use with wildlife management lands and ESAs located on the southside of Lake Red Rock east of the mile long bridge.





Plan converts North Overlook Nature Trail to a soft trail; develops a soft trail in South Tailwater.

Benefits include: 1. Proposed Concept Soft Trails combined acreage is 6.9 miles
2. Paved Volksweg Trail connects two segments of soft trails together



Mountain Biking, Trail Running, Backpacking, Growing in Popularity

According to the Outdoor Research Foundation interest in activities requiring soft or dirt trails such as mountain biking (10%), trail running (15%) and backpacking (19%) all increased by double digits in their 2008 poll. All types of biking ranked fourth overall nationally in terms of participation rates but second in terms of frequency of participation.

In a survey conducted by the Red Rock Lake Association, mountain bike/multipurpose trails was the fifth most frequently mentioned request with nearly 14% of 171 respondents mentioning soft trails as a need.

Limited Opportunities for Soft Trail Activities in Central Iowa

Soft trails are extremely limited in the Red Rock area. Currently the closest trail is approximately 40 miles from Red Rock Dam. Facilities for mountain biking trails are not meeting demand for this growing outdoor recreational activity.



Equestrian Trails Concept Planning

Goal:

- **Develop low impact, active resource based recreation opportunities.**

During initial Master Plan Meetings, stakeholder feedback was received that expanding equestrian trails and facilities on public land at Lake Red Rock should be addressed during the master plan process.

A Concept Planning Charter (CPC) team was formed to develop a concept plan for expanding equestrian trails and facilities at the lake. During development of the concept plan, the CPC team considered the following: trail implementation costs, trail operation and maintenance costs, trailhead locations, trailhead parking, trail amenities, equestrian camping locations, potential user conflicts, & potential environmental impacts. The CPC team met monthly from April to May 2012. Their charter is included in Appendix B.

To develop the concept plan, the CPC team indentified potential locations around the lake for expanded equestrian trails and facilities. Locations were evaluated using the considerations listed above. Maps were then created to show the final proposed concept plan for expanded equestrian trails and facilities. The map of the proposed concept plan for expanded equestrian trails and facilities can be viewed on the following page.

The plan utilizes the old bike trail on the north and west sides of Whitebreast Creek. The benefits include:

1. Additional 15.4 miles to current equestrian trail system at Elk Rock State Park (13 miles)
2. Ties in to current equestrian camping at Elk Rock State Park

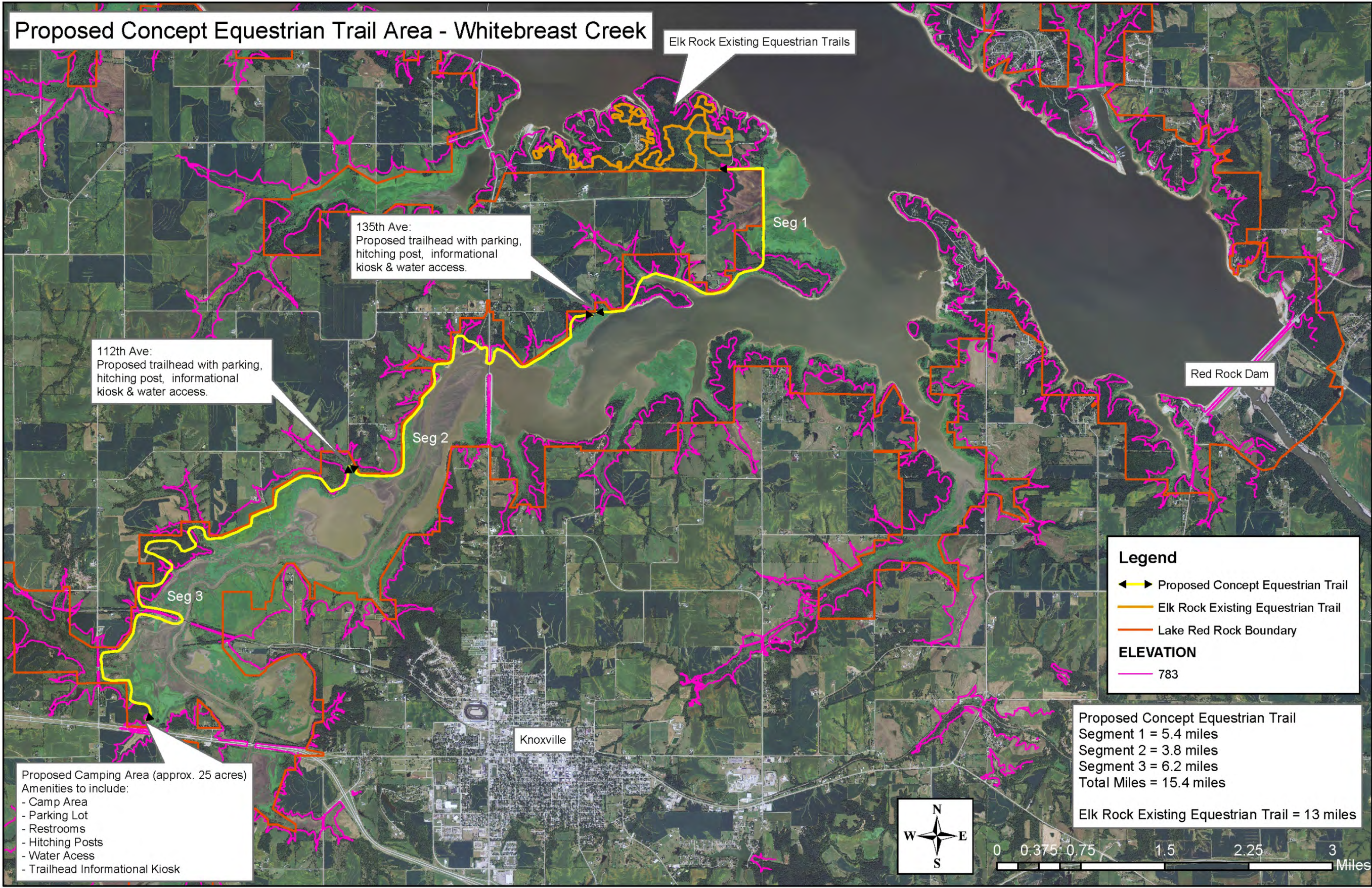
The area was designated as a trail in the 1976 Lake Red Rock Master Plan.



Equestrian Trails Concept Planning



US Army Corps of Engineers
Rock Island District



CHAPTER 3
A Natural Place to Play

Red Rock Project

Master Plan 2015



Cordova Center Concept Planning

Goal

- **Develop unique recreation opportunities that encourage respectful connection to the Environment**

Stakeholder input indicated a desire to develop an educational and visitor information center at the northwest end of Lake Red Rock as conceptualized in the Cordova Center Project under the Greenbelt Program. The Cordova Project concept plan was completed in 2008 in cooperation with local, state, Federal government and a private college: Marion County Conservation Board, Iowa DNR, the U.S. Army Corps of Engineers and Central College. The partners had evaluated potential sites around Lake Red Rock and determined that Cordova Park was the best alternative due to its close proximity to major highways making it the main entry point to the north end of the lake.

Concept planning for the Cordova Project was funded through the Des Moines Recreational River and Greenbelt. An interpretive master planning and architectural design firm developed these components in the 2008 concept plan:

Environmental Learning Center: The proposed center will provide a wide array of educational programs, high quality interactive interpretive exhibits, environmental information, meeting rooms, welcome center area, café, restrooms, creative arts space, storage, gift shop, etc.

Performing Arts Amphitheatre: The proposed facility will provide diversified arts experiences. The facility will be designed to complement the aesthetic of the outdoor nature area and be used as a multi-use facility with an emphasis on the performing arts and environmental programming.

Outdoor Educational Areas & Plaza: The proposed plans are to develop educational areas outside the Center. The proposed plaza will function as the hub of the project by connecting the outdoors to the Environmental Learning Center and Amphitheatre and provide a scenic vista of Lake Red Rock.

Other Proposed Developments: Cordova Park entrance road improvements; cabin expansion; suspension bridge and picnic facility modernization. The picnic facility modernization has already been completed through recreation mitigation from Missouri River Energy Services prior to construction of the Red Rock Hydropower Facility.

The Vision of the Cordova Center is to foster land and water stewardship by connecting people and nature through education, recreation and cultural experiences. This proposed center will positively impact economic development, tourism and quality of life for residents and visitors.

Upon completion of the 2008 concept plan, the partners held stakeholder meetings in Newton, Knoxville and Pella to share concepts, preliminary plans and gain input. The group received positive feedback from these meetings.



Cordova Center Concept Planning



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CHAPTER 3 A Natural Place to Play

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Connections

- Reduce habitat fragmentation
- Develop trail connections to area communities
- Develop effective wayfinding
- Create interpretive opportunities that connect people to the environment & encourage play in nature
- Protect/enhance access to public lands

Connections

Lake Red Rock is the largest lake and is surrounded by the largest contiguous public lands in the State of Iowa. It is located in the midst of multiple thriving communities.

Connecting people with this valuable resource is a high priority.

The goals listed below and established under the *Connections* focus area will guide and ensure opportunities to connect people to the public lands at Lake Red Rock. Protecting and enhancing public access to the 38,000 acres of land around the lake is a key goal of the Connections focus area. Access can be provided through roads; hard surface trails; soft trails; equestrian trails; and water trails. Developing road and/or trail access to project recreation and resource areas is important for visitors at Lake Red Rock and people living in area communities.

Interpretive efforts to connect people to nature are vital to future stewardship of private and public land resources.

Goals:

- Reduce habitat fragmentation
- Develop trail connections to area communities
- Develop effective wayfinding
- Create interpretive opportunities that connect people to the environment and encourage play in nature
- Protect/enhance access to public lands



Connecting people to the environment!



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CHAPTER 3
Connections

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Habitat Fragmentation

Goal:

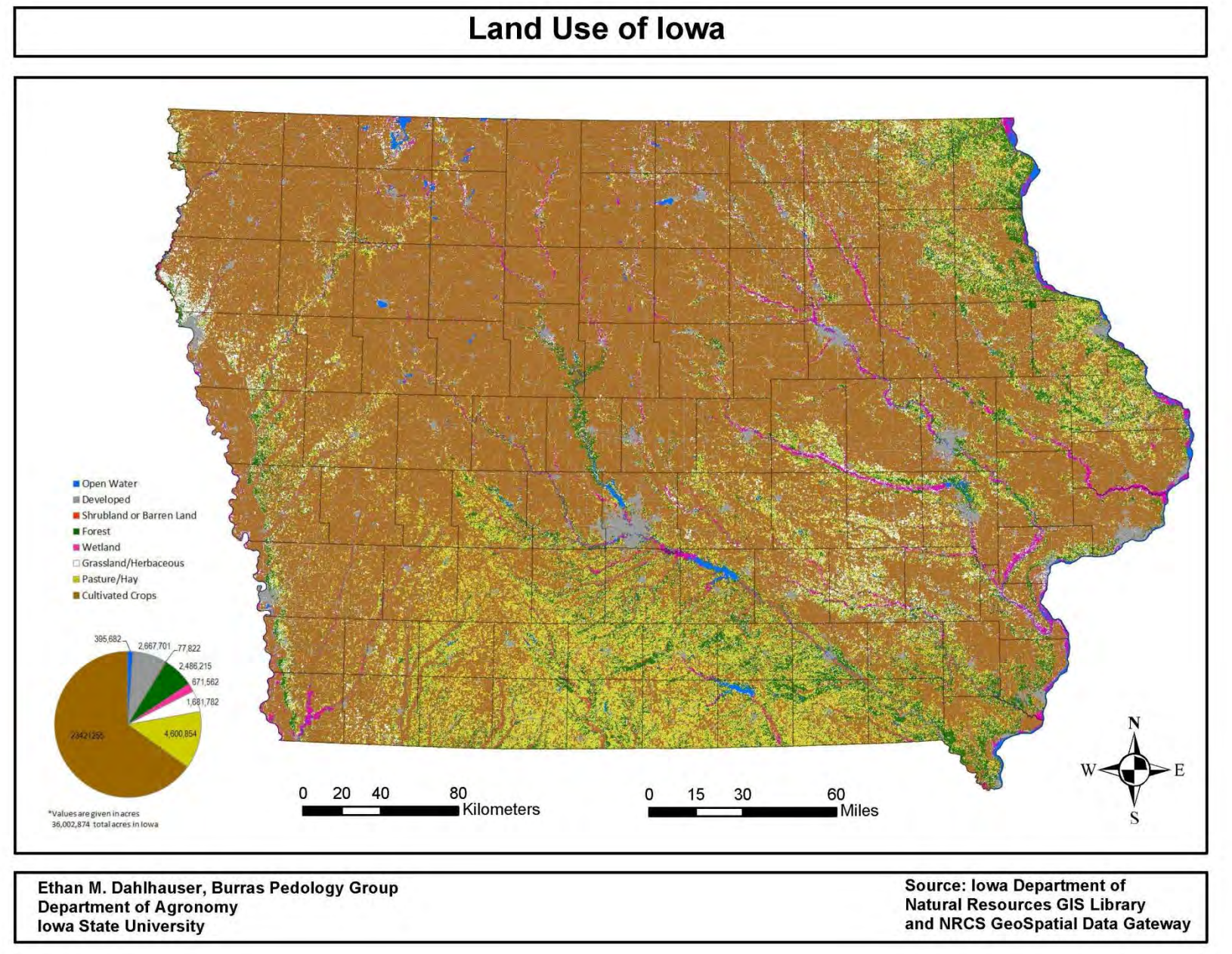
- **Reduce habitat fragmentation**

A threat to biological diversity is the fragmentation of habitats into smaller isolated pieces. The effects of fragmentation are overcrowding, increased competition, and reduced reproductive capacity, which can result in smaller populations of species that are more vulnerable to extinction, especially those plants and animals that cannot relocate to new suitable habitats.

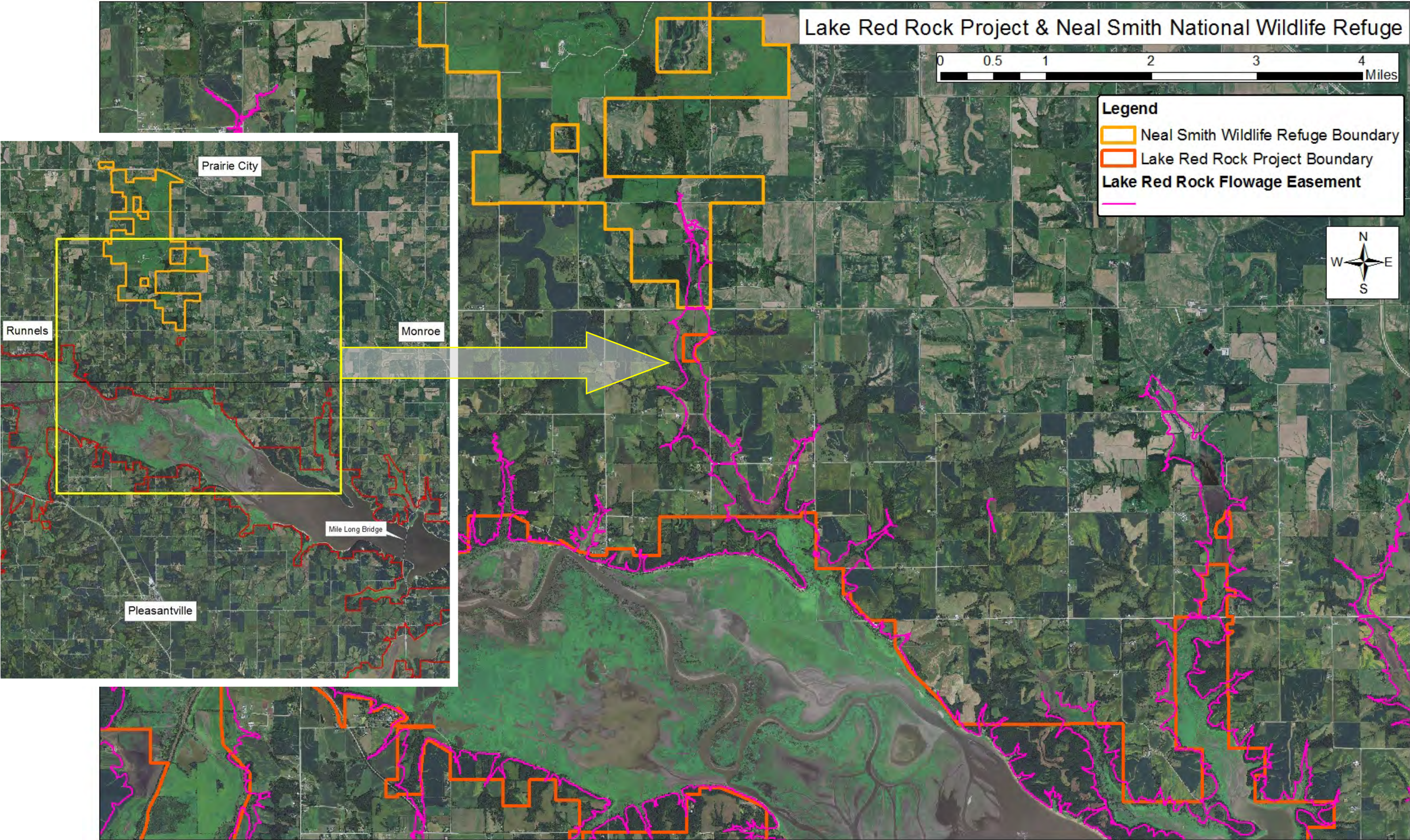
Iowa's rich, fertile soils are very productive for row crops, causing the conversion of natural habitat into agricultural production. Over 27 million acres of Iowa's 36 million acres are in agriculture. Urbanization expands into undeveloped farmland and natural areas because they are "unimproved," and are perceived as ripe for housing, retail and industrial development. Iowa also has the most extensive per capita improved road system of any state, which gobbles up even more land. The pioneer sentiment to "tame the wilderness" has come at a great cost to Iowa. When one looks at Iowa's land use (see map) it is realized that there are islands of native biodiversity, and these islands are greatly disconnected.

Lake Red Rock provides vital habitats—prairies, woodlands, and wetlands—utilized by over 300 species of birds, dozens of species of mammals, reptiles, amphibians, fish and invertebrates. Lake Red Rock Project serves as an important depository of biodiversity. It is a link to other habitats via the Des Moines River Greenbelt corridor and close association to Neal Smith National Wildlife Refuge and others.

An example of how habitat fragmentation can be corrected or minimized is shown on the following page. As opportunity presents, continued connection of Corps and Refuge lands will bring long term benefits to the public.



Reduce Habitat Fragmentation





Trail Connections Concept Planning

Goal:

- **Develop trail connections to area communities**

During initial master plan meetings, stakeholder's strongly encouraged expanding paved trails on public land at Lake Red Rock. Possible trail connections from public land at Lake Red Rock to area communities were also addressed during the master planning process.

A Concept Planning Charter (CPC) team was formed to develop a concept plan for expanding the current paved bike trail at the lake and for determining possible paved trail connections from the lake to area communities. The finished concept plan would be included in the new master plan.

During development of the concept plan, the CPC team considered the following: trail implementation costs, trail operation and maintenance costs, trailhead locations, trailhead parking, trail amenities, potential user conflicts, and potential environmental impacts. The CPC team met monthly from January to March 2012. Their charter is included in Appendix B.

To develop the concept plan, the CPC team first identified area communities that may eventually look to establish paved trail connections to the lake. After identifying the area communities, the CPC team determined possible trail routes from the area communities to public lands at the lake. The CPC team then created maps to show the possible paved trail connection points on public lands as well as possible paved trail routes from the connection points to the existing Volksweg paved trail at the lake. The team also identified and mapped possible paved trail route locations on public lands to connect all recreation areas around the lake.

Maps of the proposed paved trail connection points to public lands and the proposed trail routes on public lands can be viewed on the following pages. Additionally, a map showing area communities that may eventually look to establish paved trail connections to the lake can also be viewed on the next pages.

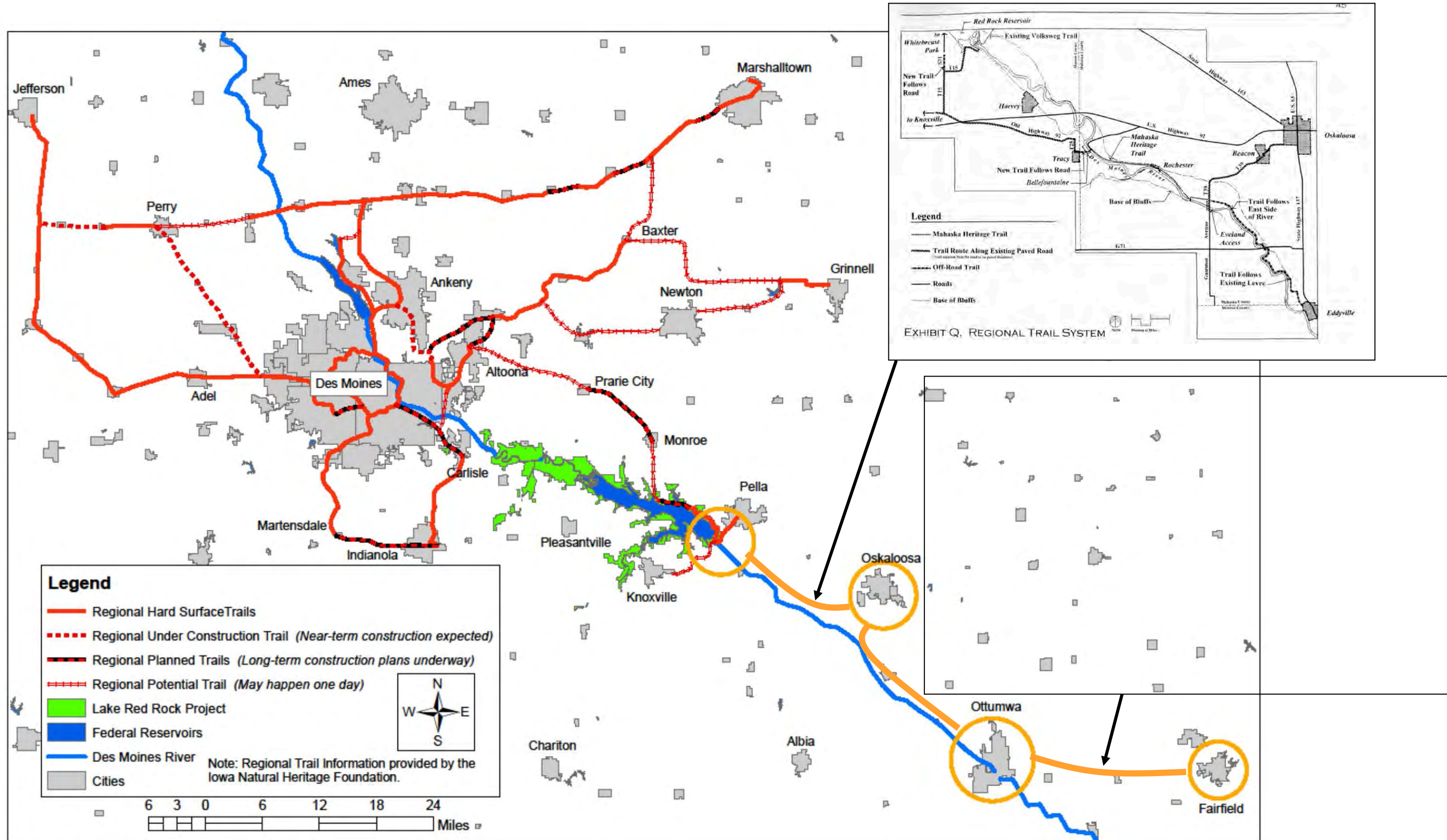
Additional efforts are currently underway to develop a comprehensive trails master plan for the Marion, Jasper, Madison, and Warren County area. This work is being conducted under the auspices of the National Park Service's Rivers, Trails & Conservation Assistance Program.



Regional Trails Concept Planning



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CHAPTER 3 Connections

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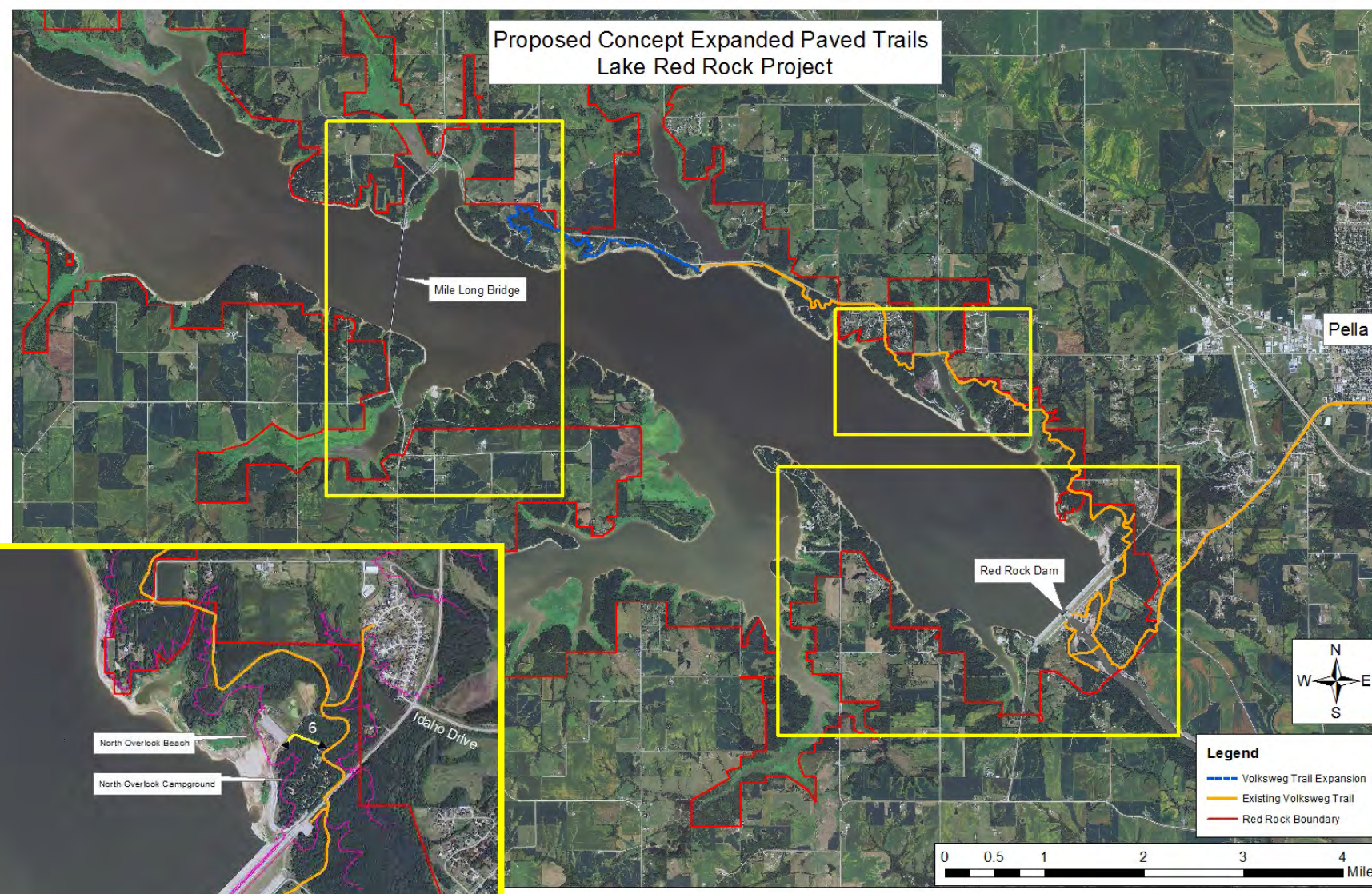
Master Plan 2015



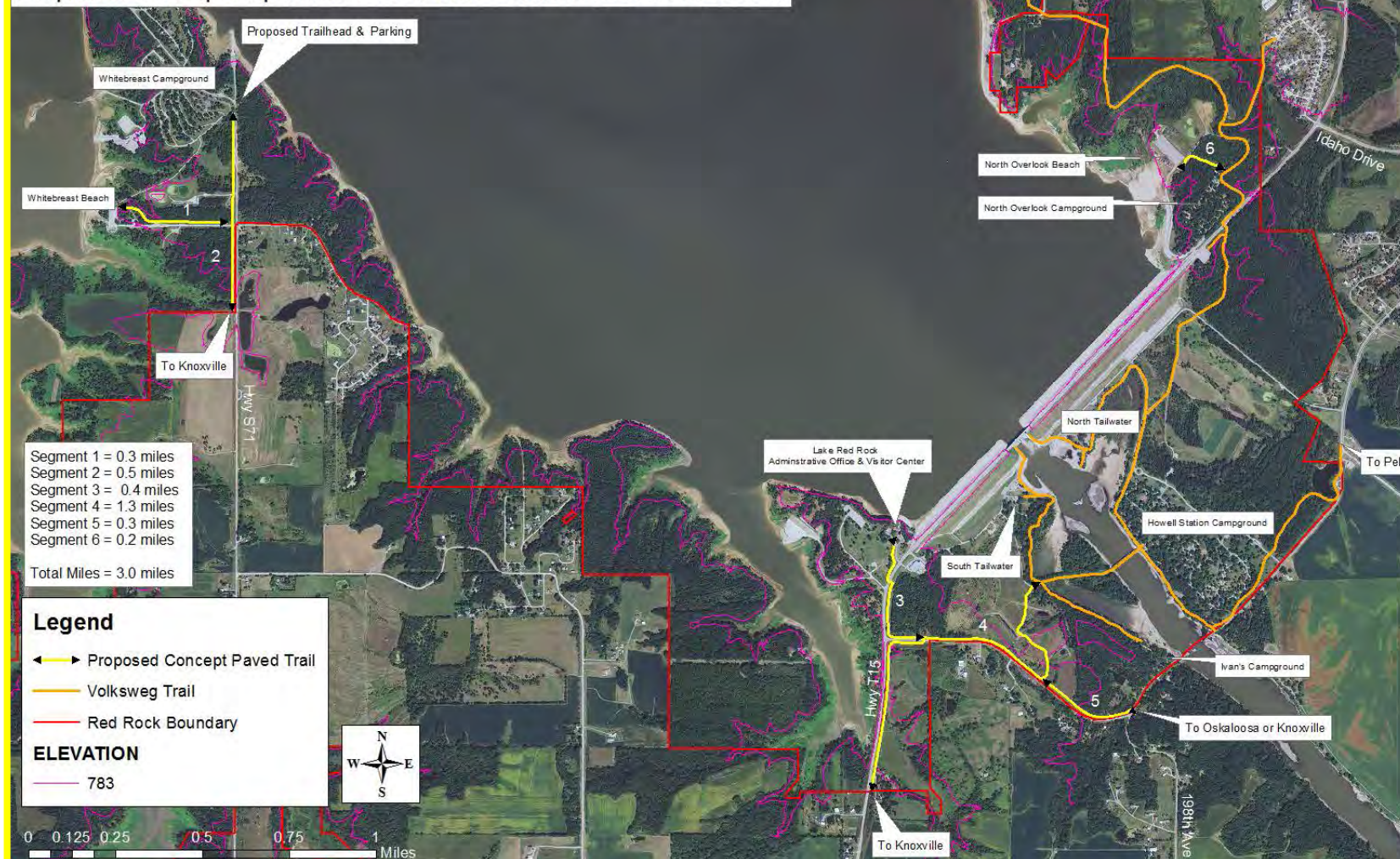
Red Rock Trails Concept Plan

Concept Plan Focus Points:

- ⇒ Expand paved trail network to connect all recreation areas around the lake
- ⇒ Expand paved trail network to connect with other communities and trails
- ⇒ Strong partnership potential
- ⇒ Focus group input



Proposed Concept Expanded Paved Trail - Whitebreast & Dam Area





Red Rock Trails Concept Plan





National Water Trail

Goal:

- **Develop trail connections to area communities**

The Iowa IDNR defines water trails as “recreational corridors and routes on rivers and lakes that provide a unique experience for canoeists and kayakers.” Water trails provide adequate access points that can be used for planning trips at various lengths and difficulty. A water trail may also provide access to riverside campgrounds, primitive campsites, and other amenities. There are 18,000 miles of navigable streams in Iowa.

Water trails connect visitors to the history, geology, wildlife and culture of the area. The trails also promote a land and water stewardship ethic.

Recreational trends in Iowa show an increased interest and use of paddle sports. The 2013 State Comprehensive Outdoor Recreation Plan (SCORP) showed that there was a 27% increase from 2006 in canoeing and kayaking in Iowa.

The Lake Red Rock Water Trail is designated as a National Water Trail by the National Park Service and as State Water Trail by the Iowa DNR. The Des Moines River watershed is an incredibly diverse system, providing a great deal of opportunity.

Through partnerships, potential connections exist upstream and downstream of Lake Red Rock. Downstream - Des Moines River in Wapello and Van Buren counties (Eldon to Farmington); Upstream - Emmet and Palo Alto counties.

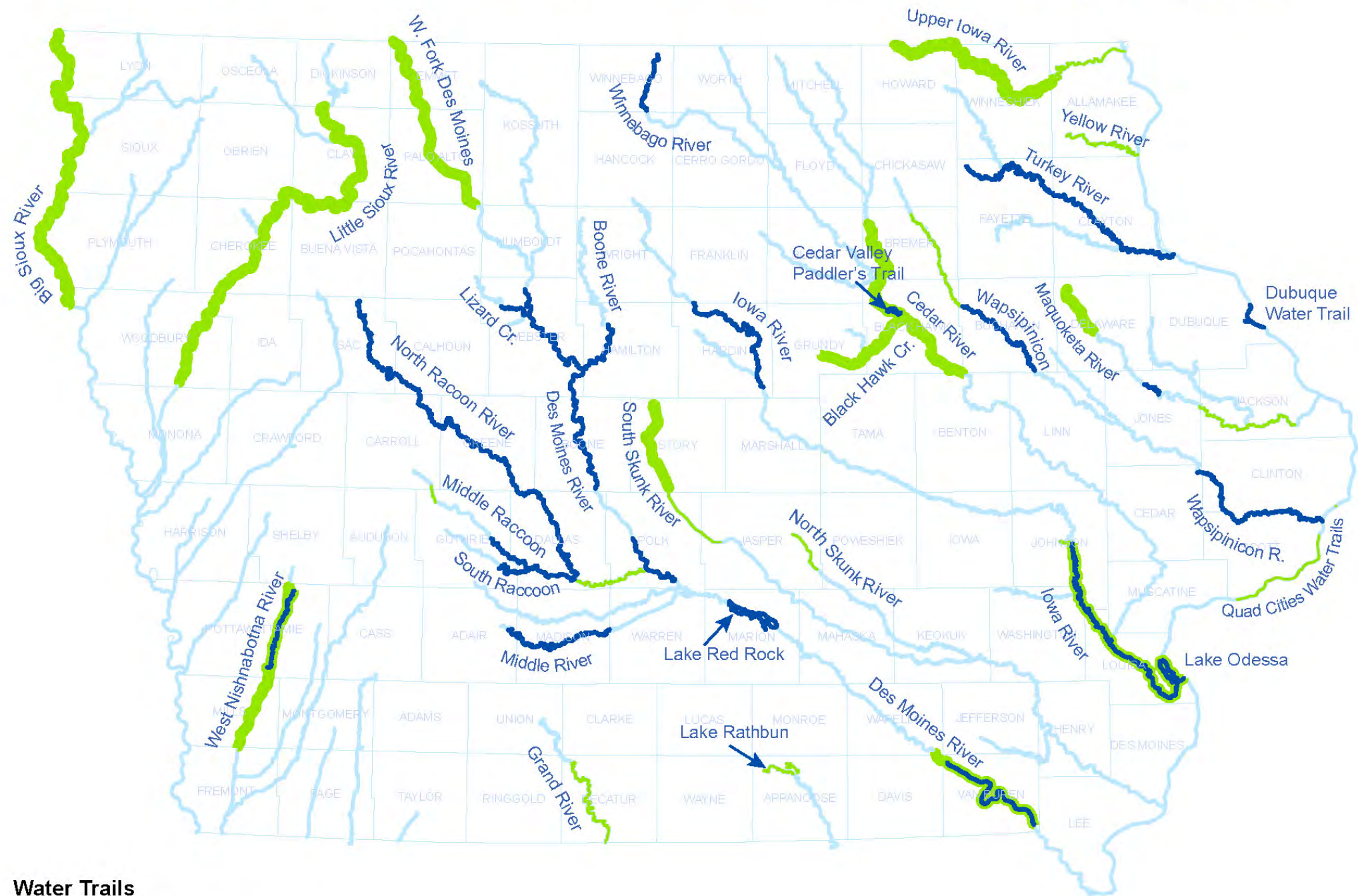


Water Trails of Iowa and Regional Influence



US Army Corps of Engineers
Rock Island District

2014 Water Trails & Water Trail Study Areas



Water Trails

- State Designated (923 miles)
- Study Areas (892 miles)
- Potential Study Areas (327 miles)

CHAPTER 3 Connections

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Wayfinding

Goal:

- **Develop effective wayfinding**

During initial master plan meetings, stakeholder feedback was received that improving roadway navigation around Lake Red Rock should be addressed during the master planning process. A CPC team was formed to create a concept plan for wayfinding at Lake Red Rock that would be included in the master plan revision. Wayfinding for the purpose of the CPC team was defined as the way in which travelers use signs, maps and other graphic methods to orient themselves and navigate from place to place. The CPC team met monthly from Dec 2011 to April 2012. Their charter is included in Appendix B.

The CPC team developed a wayfinding concept plan including a proposed wayfinding districting system and a proposed wayfinding sign system. During development of the wayfinding concept plan, the CPC team used the following goals & objectives to improve navigation around Lake Red Rock: developing consistency of navigation signs, determining proper navigation sign placement per traffic flow patterns, identifying key areas of interest including possible districts and communication hubs around the lake, and developing print & electronic navigation materials that were consistent with the wayfinding concept plan.

To develop the wayfinding concept plan, the CPC team first identified the major traffic routes that visitors use to get to Lake Red Rock as well as the existing navigation signs in place along the traffic routes around the lake that direct visitors to all the significant destinations at the lake.

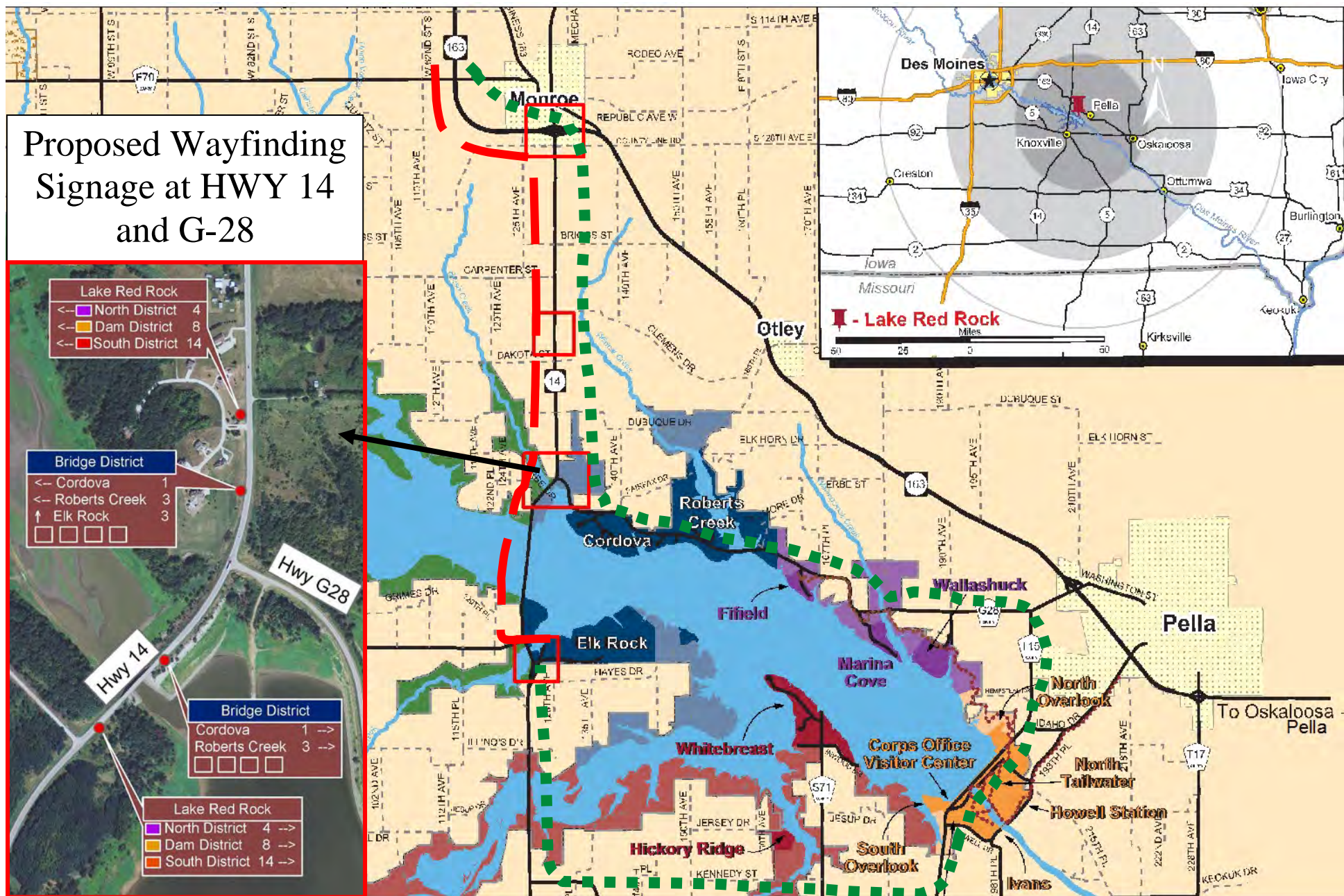
The CPC team then used the goals and objectives that were established by the team to develop a districting system. Districting is a common navigation system used in cities and towns. The concept of the districting system was to make navigation easier by grouping destinations around the lake based on the best travel route to those destinations. Travelers to the lake would first navigate to the district that their destination was in and once in that district would then navigate to their destination. The proposed districts were named and given a color so they could be easily identified. The proposed district names were selected based on geographic location. Once the proposed concept districts were established, the CPC team then developed a proposed concept wayfinding sign system which incorporated the district names and colors into proposed new navigation signs. The proposed concept wayfinding sign system also identified the best locations for the proposed new navigation signs around the lake.

A map of the proposed concept wayfinding districting system and maps and photos of an example of the proposed concept wayfinding sign system is included on the next page of the master plan.





A Proposed Wayfinding Plan



How DO you get to Elk Rock State Park?

Indicates proposed wayfinding signage to direct visitors to their destination.

Indicates existing signage/potential path visitors take to get to Elk Rock.

Existing Signage at Highway 14 and G-28



South District	Bridge District	North District	Dam District	Wildlife District
Whitebreast Beach	Robert's Creek Archery Range	Red Rock Marina	North Overlook Beach	Red Rock Wildlife Unit
Whitebreast Campground	Robert's Disc Golf Tower	Fifield	North Overlook Campground	Red Rock Water Trail
Hickory Ridge	Robert's Creek East Campground	Wallashuck Campground	North Overlook Picnic	
Whitebreast Youth Camp	Robert's Creek West Campground	Wallashuck Nature Trail	North Overlook Nature Trail	
Red Rock Water Trail	Robert's Creek East Boat Ramp	Volksweg Trail	Red Rock Dam	
Whitebreast Boat Ramp	Robert's Creek West Boat Ramp	Red Rock Water Trail	Howell Station Campground	
Whitebreast Coal Miner's Retreat	Cordova Cabins	Marina Cove Boat Ramp	Howell Station Boat Ramp	
Stu Kuyper Trail	Cordova Boat Ramp	Wallashuck High Water Boat Ramp	Howell Station Prairie Trail	
	Cordova Tower		Ivan's Campground	
	Karr Trail		Eagle Lair Nature Trail	
	Red Rock Water Trail		Volksweg Trail	
	Elk Rock Campground		Red Rock Water Trail	
	Elk Rock Boat Ramp		Red Rock Visitor Center	
	Elk Rock Equestrian Trail		North Tailwater	
			South Tailwater	



Interpretation

Goal:

- Develop interpretive opportunities that connect people to the environment and encourage play in nature

Interpretation is a highly effective tool to communicate Lake Red Rock Project missions and water safety program; and reach partners and stakeholders in surrounding communities. This “tool” provides a way to connect people to the natural environment at Lake Red Rock, which can lead to increased enjoyment of the lake and stewardship of public lands.

Lake Red Rock’s interpretive program informs the public about the lake projects three-fold mission of flood risk management, environmental stewardship and recreation using fun and entertaining methods. The MCCB, the Iowa DNR, Corps park rangers, students, and volunteers provide on-site and outreach programs for visitors, schools, civic groups, clubs and other organizations.

Visitors have indicated that they enjoy and highly value programs that allow them to be able to experience nature and actually participate in an activity. Lake Red Rock interpretive program provides paddling activities, snow shoeing hikes, geo caching, night hikes, fishing activities, nature crafts etc. to fulfill this desire.

Efforts to continue the interpretive program using staff, students and volunteers will be continued. These programs greatly enhance the visitor experience at Lake Red Rock resulting in repeat attendance to programs, the visitor center, resource areas and recreation areas.

The interpretive program continues to evolve with new methods and trends. The Science, Technology, Engineering and Math program and experience-based programs are the current “new” trends that are being utilized and incorporated into Red Rock’s interpretive plans.

Future infrastructure development for the interpretive program at Lake Red Rock may include development of a natural playscape in conjunction with a new visitor information and administration office. This may include interpretive nature trails, amphitheater, and natural play elements. Additional development may include a natural playscape at the Whitebreast Recreation Area and the Cordova Park. These playscapes serve as interpretive hubs.

In 2013, of the top 10 activities to do in Marion County, Lake Red Rock’s nature programs were voted #1.



Examples of Current Interpretative Programs



Kids Outdoors Program

Lake Red Rock has an equipment check-out program, referred to as “Kids Outdoors”, to give visitors the opportunity to experience snow shoeing, geo caching, pond study, plant or animal ID, etc. during an interpretive program or on their own. This provides another way for visitors to connect to nature using the equipment shown below.

Snowshoes



Adult and Youth Sizes Available:
(sized by weight of wearer)

- Youth 16" (25-60 lbs.)
- Youth 19" (50-110 lbs.)
- Adult 22" (80-11 lbs.)
- Adult 26" (120-200 lbs.)
- Adult 30" (170-200 lbs.)
- Adult 36" (200-350 lbs.)

Pond Exploration Packs:



Each Pack Includes:

- Dip Net
- White Plastic Tub
- Critter Box with Lid
- Two Kinds of Magnifiers
- Pond Life Golden Guide
- Pond Life Pocket Naturalist
- IOWATER Identification Key

Kayaks and Canoes*

*Available for checkout only during scheduled program dates and times, and must be at least 10 years old to use kayaks



GPS / Geocaching Pack:



Each Pack Includes:

- One "Etrex H" GPS Unit
- Backpack
- Two Extra AA Batteries
- Maps and Coordinates for Geocaches around lake

Bird Exploration Packs



Each Pack Includes:

- Binocular
- Sibley Bird Guide
- "Birding by Ear" CD
- "A Feather Magnet" Bird Checklist

Disc Golf Fun Pack:

Try them out at Roberts Creek Disc Golf Range!



Each Pack Includes:

- Putt and Approach Disc
- Mid-Range Disc
- Fairway Driver Disc
- Backpack
- Basic Instructions
- Score Cards and Pencil



Nature Hikes



Water Safety



Water Safety



Kayaking



Snowshoe Hikes



Wildlife Programs



Natural Playscape

Goal:

- Develop interpretive opportunities that connect people to the environment and encourage play in nature

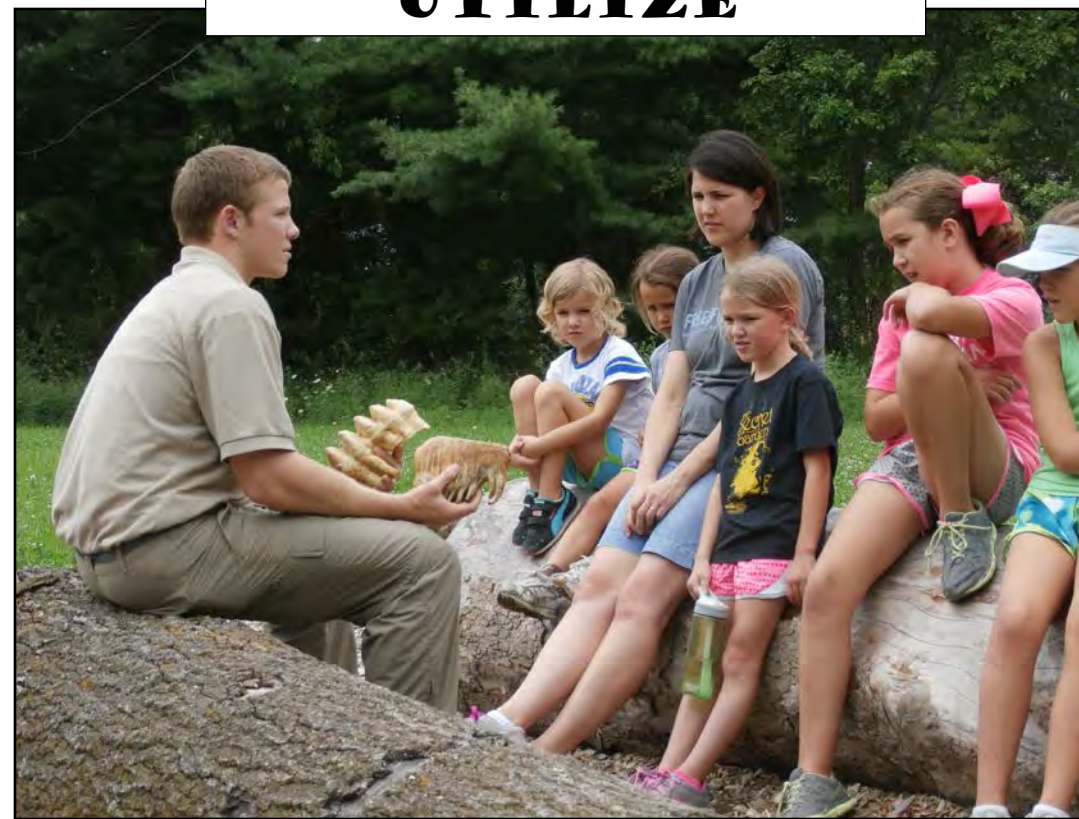
A “playscape” is an outdoor learning area that incorporates nature, exploration, imagination and interpretation. Hills, art, paths, logs, rocks, flowers, open areas, water, sand, and more create a beautiful place to play and connect groups and individuals to the environment.



The concept of a natural playscape was developed through partnerships with Central College and various private groups. Members of these various organizations designed concept plans. Funding resources were sought and volunteers congregated to construct the playscape located in the North Overlook Area.

During the master planning process, additional locations were identified as future playscape sites as shown on the map on the next page. The playscape is designed to be utilized as a hub for interpretive services and outreach. Interpretive programming for the local community, lake visitors and school groups will provide unique opportunities throughout the year to provide education outside of a typical classroom. Continued partnerships with local educational institutions and other government and non-governmental entities will further the value of these sites.

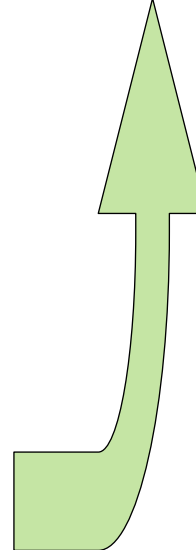
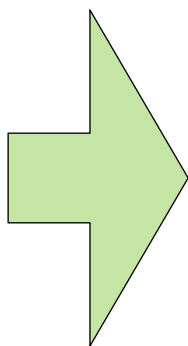
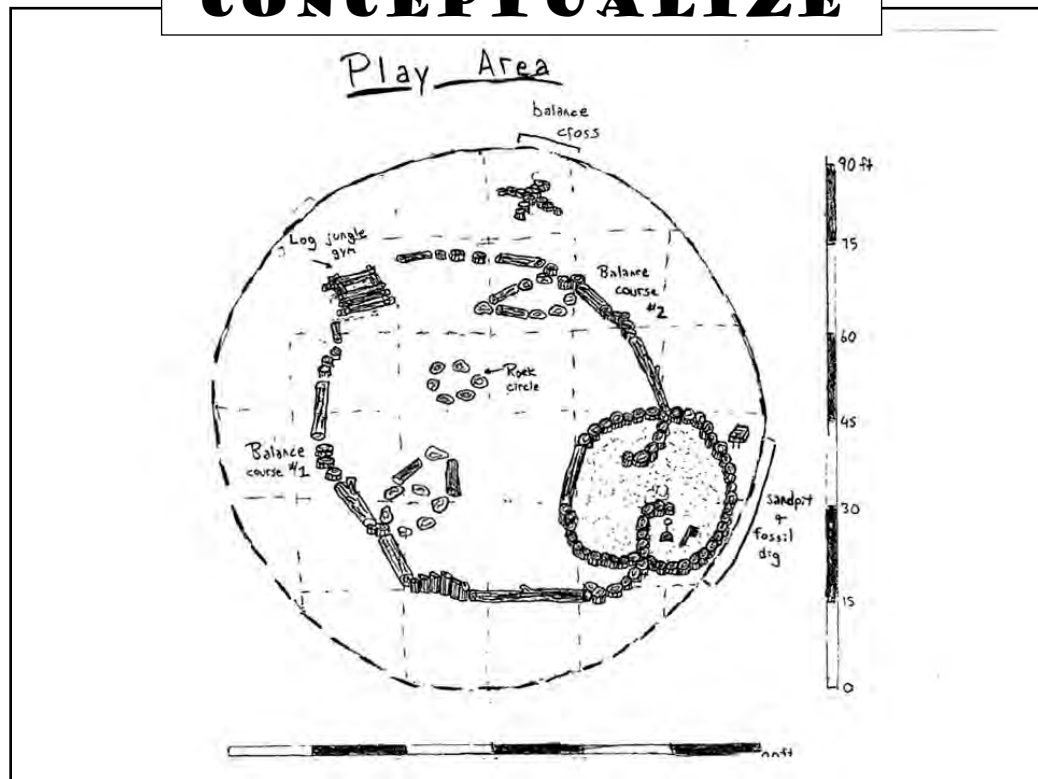
UTILIZE



CONSTRUCT



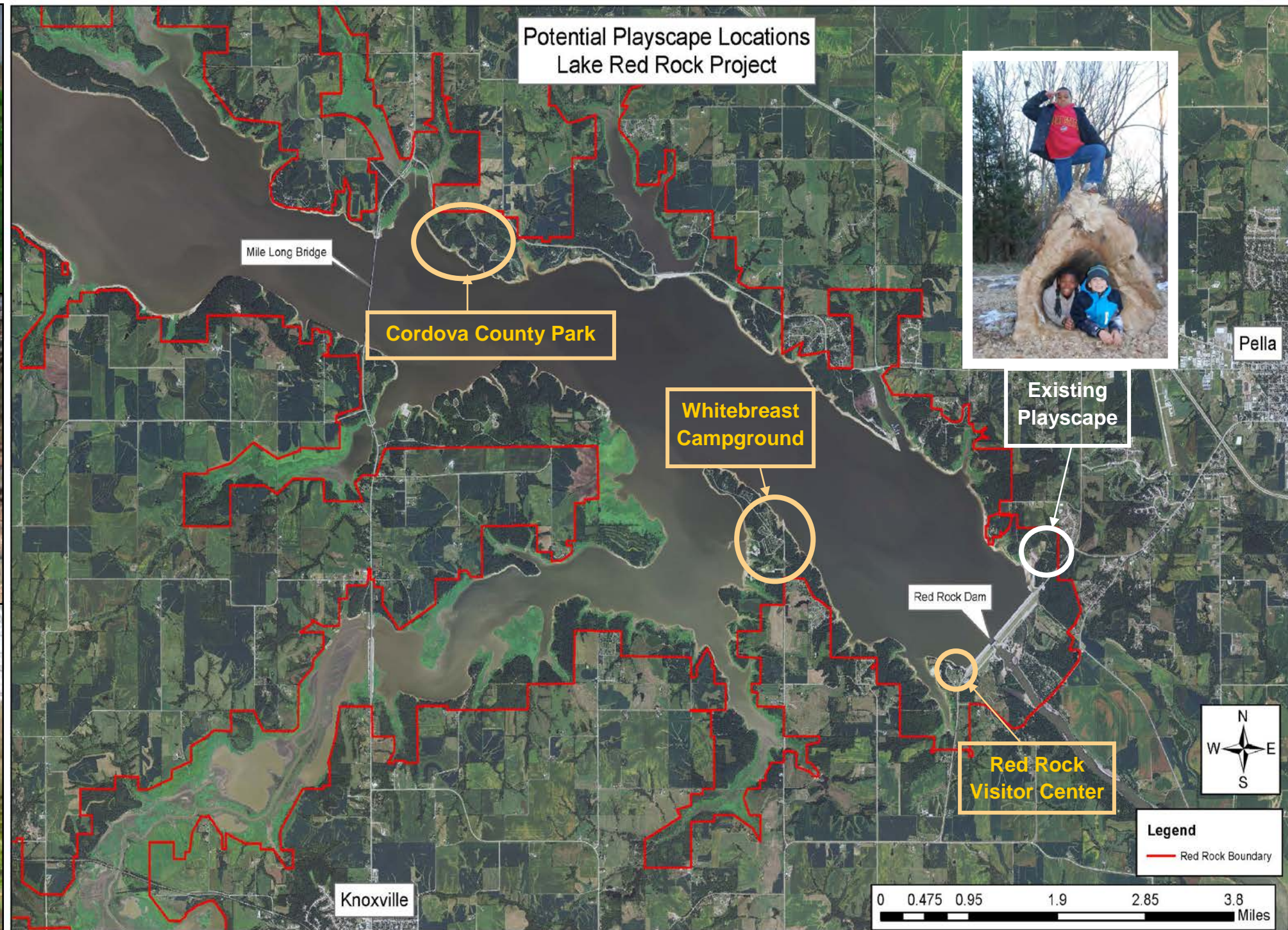
CONCEPTUALIZE





Future Playscape Development

Future potential locations for additional natural playscape development are located at Cordova County Park, Red Rock Visitor Center, and Whitebreast Campground. These areas have open sites that are well suited for this type of development. Preferred locations for playscapes are adjacent to woodlands, ponds, wetlands and/or prairies which provide a multitude of environmental learning opportunities.





Watchable Wildlife Areas

Goal:

- **Develop interpretive opportunities that connect people to the environment and encourage play in nature**

Thousands of Iowans enjoy watching wildlife and make it a monthly, weekly or even daily activity around their home or at natural destinations. According to a US Fish and Wildlife Service National Survey, 48% of Iowa's citizens participate in some form of Wildlife Watching.

Watchable Wildlife Areas are locations that tend to attract a greater diversity and abundance of wildlife due to the habitat features of the site. These areas provide better opportunities for people to view wildlife in their natural habitats. These sites usually have design elements or developed features that enhance the experience of the viewer, while limiting disturbance to the wildlife.

While seeking stakeholder input for environmentally sensitive areas (ESAs), birding and other wildlife groups indicated many locations that were important for wildlife viewing. Many of these sites were not determined as ESAs, but a need to appoint them as significant wildlife viewing locations was obvious. This led to the concept of Watchable Wildlife Areas around Lake Red Rock as shown on the map to the right.



Wildlife viewing is an important recreational pursuit for the general public, especially in Iowa. The vast majority of land in Iowa is privately owned and limits opportunities to see wildlife. Lake Red Rock's 50,000 acres of land and water provide the chance for visitors to routinely see bald eagles, river otters, butterflies, pelicans, etc., and occasionally get a rare glimpse of a Ross's gull from the arctic. These rare species attract birders from all over the United States that provide an economic boon for area communities.

In some instances wildlife viewing may conflict with routine operations and maintenance of a recreation area (e.g. shotgun hunting seasons), however, considerations should be made to allow viewing of these rare animals when applicable.

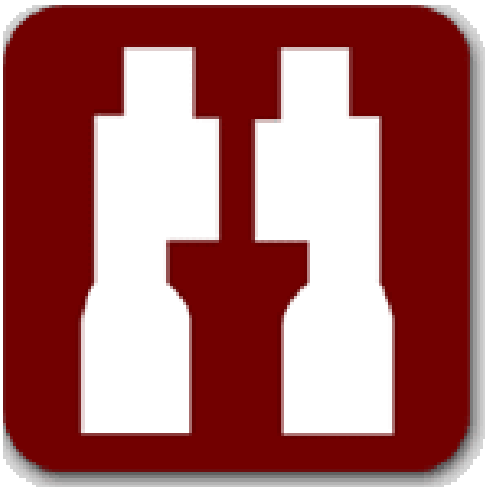
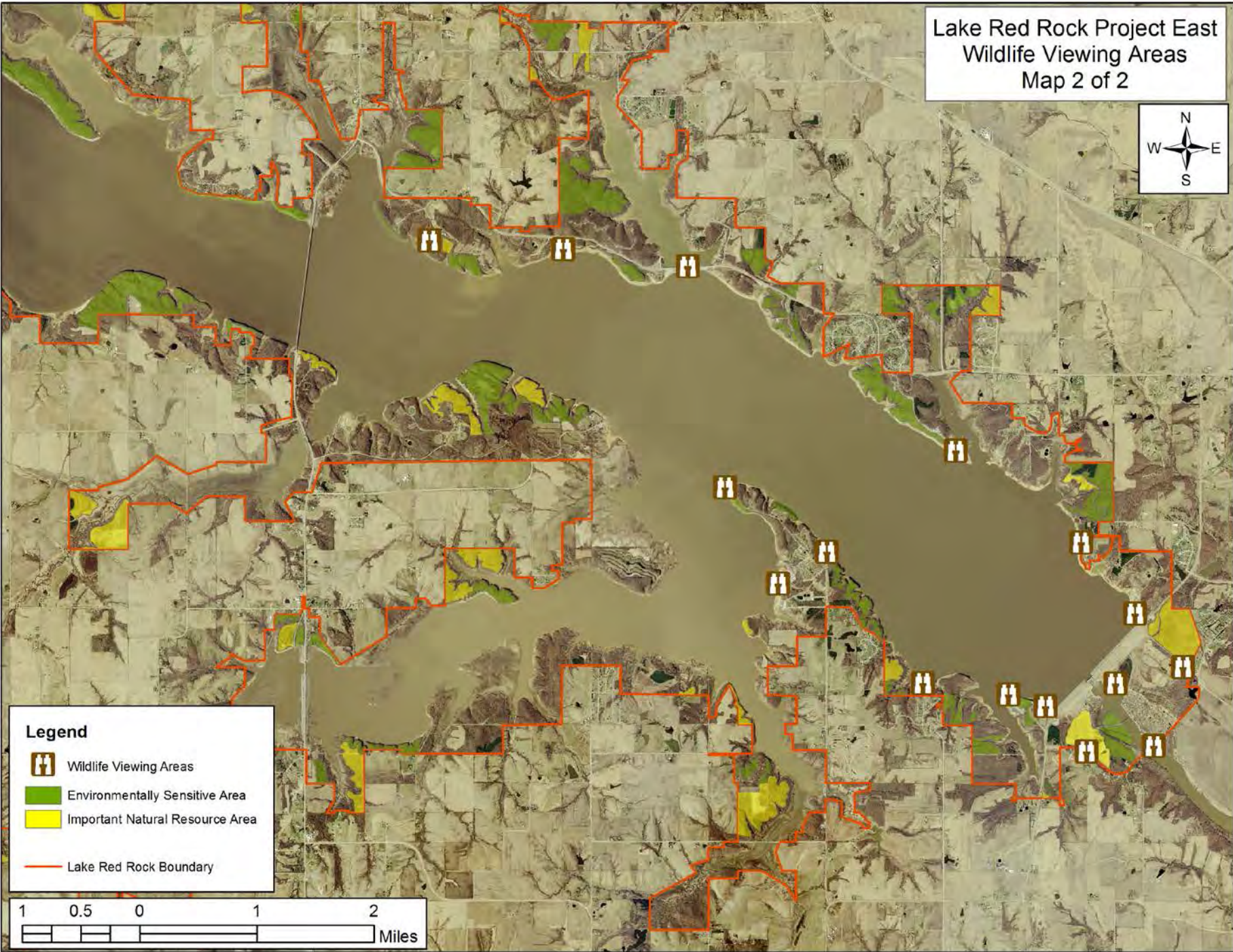
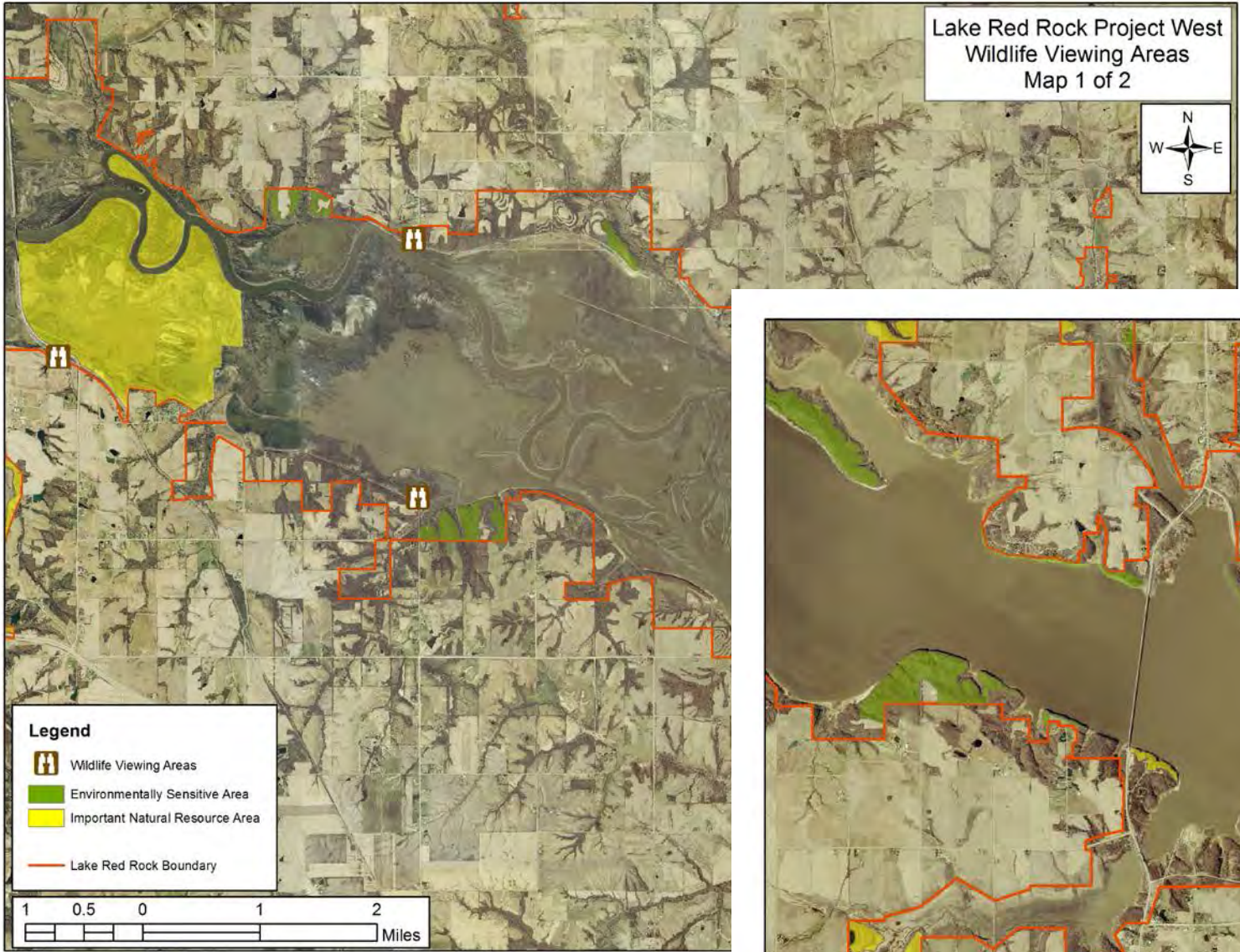
An effort to develop Watchable Wildlife areas to enhance the viewing experience, where feasible, for the first time visitor and experienced wildlife watchers will be continued at key locations.

Wildlife viewing has been identified as one of the most common recreational activities Iowans enjoy. It is vital that public access to the designated Watchable Wildlife areas around Lake Red Rock remain open so all can enjoy a soaring eagle, a migrating monarch, or a visitor from the Arctic.

Watchable Wildlife Areas Around Lake Red Rock



Lake Red Rock is listed as a Globally Significant Bird Area by the American Bird Conservancy



Public Access

Goal:

- **Protect/enhance access to public lands**

Public and agency access to public lands will continue to promote sustainable environments and natural places to play.

The Lake Red Rock Project has approximately 53,000 acres of land and water. This land mass presented a great opportunity for wildlife management, forestry, grassland management and recreation. Great progress was made in these techniques from the implementation of the 1976 Master Plan to 2012, making Red Rock, Iowa's Place to Play. As such, the Lake Red Rock Project represents a huge investment in taxpayer money that has reaped many rewards in flood risk management and positive economic impact, such as tourism, in the area economies. Yet, the value of this public asset is much reduced if people cannot get to it to hike, hunt, fish, and boat--whatever one's recreational choice.

Once the Lake Red Rock Project was completed, there were some old farm-to-market and gravel roads that were left open to provide access to these public lands. As time wore on, wear and tear took their toll on the roads. Some roads that led into the valley were vacated, abandoned, or merely closed. While they once may have been vital links to a farming countryside and bustling towns, their usefulness became less obvious with the absence of people living on the land. Nevertheless, even though they no longer serve as school bus routes or a pig's trip to the market, they still provide an essential connection to land for people who seek to use and enjoy this resource.

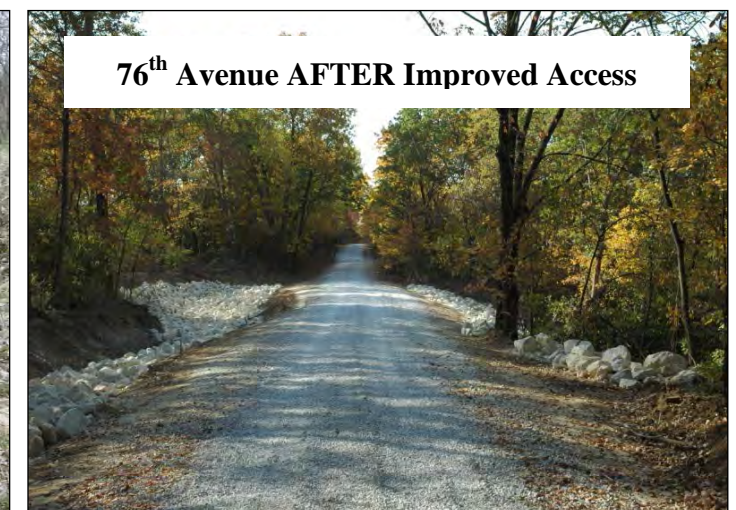
It is a Master Plan goal to preserve all existing access routes onto Lake Red Rock lands for public and agency access; search and rescue; and as portals to adventure. If these accesses are not preserved in public ownership, it can be cost prohibitive or impossible to reestablish them.

Furthermore, there are locations where no existing public roadway exists, and, due to the meandering alignment of the fee title boundary, no access to Corps property is available except by permission from neighbors. In those locations, acquisition of right of way easement, right of entry, or similar device, should be pursued to allow at a minimum Corps access for management and search and rescue.

Below is an example of what has been done to restore access for public use. This will continue as opportunity allows.

Acquiring Road Easements from Marion County: Example: 76th Avenue

This road provides access to a 1,000 acre peninsula of native woodlands. An easement for this road was acquired from Marion County to continue to provide public access to public ground. Currently, the Corps of Engineers is working in partnership with Marion County to assure that the public continues to have access to Lake Red Rock lands and water.



Public Access Matters



US Army Corps
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Rock Island District



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