

# Chichaqua Bottoms Greenbelt

## Master Plan



Prepared for Polk County Conservation Board  
May 2003

## Polk County Conservation Board Vision Statement

"It is the vision and the goal of the Polk County Conservation Board and staff to provide a variety of park experiences equitably throughout our county. Parks will be developed and maintained at the highest quality, ensuring a safe environment with exceptional customer service while sustaining our mission for land conservation. Program services will be designed and developed to educate and teach citizens of all ages how to enjoy and preserve the natural environments of Polk County through a series of targeted outdoor recreational experiences. Parks and recreation services will be provided through effective partnerships with cities in Polk County and other conservation agencies, ensuring a high quality of life for all Polk County residents."

*Strategic Master Plan Draft 2002  
Polk County Conservation Board  
Polk County, Iowa*

## Chichaqua Bottoms Greenbelt Mission Statement

The mission of the Chichaqua Bottoms Greenbelt is to restore vegetation and hydrology to pre-settlement conditions, to manage for bio-diversity, and to provide recreation that is compatible with the natural resources of the area.

## I. INTRODUCTION

The *Chichaqua Bottoms Greenbelt Master Plan* provides the tools and mapping required to establish a plan for future development and management of the largest county park in Iowa. This plan is derived from the unique natural resource and the vision of the future created by the Polk County Conservation Board through broad-based participation of friends, users, and stakeholders. During the development of this plan, input from the community was vital. A Steering Committee was formed to help lead this project from beginning to end. The Steering Committee included representatives of the Polk County Conservation Board and staff, adjoining landowners, and interests groups actively involved in Chichaqua Bottoms Greenbelt. A community-wide workshop was held to gain input and support. A detailed site inventory and analysis process assisted in the identification of existing features and sensitive areas of Chichaqua Bottoms Greenbelt. The *Master Plan* is based on the outcomes of the community input process and the site inventory and analysis process. The *Master Plan* applies the information and data gathered during these two processes to provide a community supported plan.

The *Chichaqua Bottoms Greenbelt Master Plan* identifies improvements, builds on the strengths of existing features, supplements existing facilities, provides opportunities for connections throughout, and identifies Chichaqua Bottoms Greenbelt as a place of importance to Polk County residents.

## II. PLANNING PROCESS

A vital part of the *Chichaqua Bottoms Greenbelt Master Plan* was input and information gathered from the Steering Committee and the community. The *Master Plan* takes into account the numerous user groups and opportunities within the community. Through extensive workshops with various groups and input from the Steering Committee, the planning process resulted in a plan that provides a variety of connections and diverse opportunities and is supported by public and private sectors.

### WORKSHOPS

The Steering Committee consisted of six individuals, representing a variety of groups and organizations. Following is the list of Steering Committee members along with the organization each represents.

1. Ben Van Gundy, Polk County Conservation Board, Director
2. Red Brannan, Polk County Conservation Board, Chairman
3. Mark Thompson, Polk County Conservation Board, Staff
4. Patrick Phelan, Landowner
5. Lynn Schreurs, Pheasants Forever and private citizen
6. Jane Clark, Des Moines Audubon



A series of three workshops was conducted with the Steering Committee. The first workshop was held on May 13, 2002. At this workshop, the project scope and a base map of Chichaqua Bottoms Greenbelt were reviewed. The Steering Committee participants then identified the goals (what needs to be achieved for the trails plan), critical issues, additional stakeholder participants that should be involved in the process, development criteria, and surrounding context implications.

The second workshop with the Steering Committee was held on July 16, 2002. At this workshop, the goals, issues, stakeholders, surrounding context implications, and development criteria that were identified in the previous workshop were reviewed and discussed. The site inventory and analysis maps were presented to the Steering Committee for their review. Inventories and analyses were prepared for vegetation, recreational facilities, hunting, slope range and soil erosion.



Additional maps identified transportation and parking, and acquisition/ownership. A criteria analysis map was prepared that showed the entire Chichaqua Bottoms Greenbelt as highly sensitive. Participants were asked about their perceived results and local design cues; users, constituencies and potential partners; and desired uses for Chichaqua Bottoms Greenbelt.

Before holding a third committee workshop, a Community Input/Design Charrette Workshop was conducted on August 20, 2002. This workshop was open to anyone interested in Chichaqua Bottoms Greenbelt.

Invitations were sent to interest groups known to the Conservation Board and to groups identified during workshops one and two. By involving a variety of people from throughout the community, the *Chichaqua Bottoms Greenbelt Master Plan* includes diverse opportunities and interests. These workshops gave enthusiasts and supporters the opportunity to share ideas and suggestions about

Chichaqua Bottoms Greenbelt. The Community Input Workshops began with a discussion of background information on the proposed project. The goals, issues and concerns, and criteria identified by the Steering Committee were reviewed and discussed. The participants at the workshop then participated in a mapping exercise that utilized desired uses identified by the Steering Committee. The participants placed desired use stickers on a map to show where identified uses occurred or could occur. They were not required to use all sticker icons, only those believed to be relevant to Chichaqua Bottoms Greenbelt. The results from these workshops were compiled into one map, showing the potential uses and locations identified by workshop participants.

Those attending the Community Input Workshops included:

1. Jo Hudson, Sierra Club
2. Jane Clark, Audubon Society
3. Virginia Soilberg, Environmental Education
4. Cheryl Waskow
5. Sue Davies
6. Ty Smedes
7. Steve Sieloff, Mid-Iowa Retriever Club
8. Jim Carlisle, Mid-Iowa Retriever Club
9. Joyce Hornstein
10. Eric Marcks
11. Craig Lusthoff, Mid-Iowa Retriever Club
12. Joe McGovern, Iowa Natural Heritage Foundation
13. Bruce Mountain, Iowa Natural Heritage Foundation and Mid-Iowa Retriever Club
14. Terry Plagman, Mid-Iowa Retriever Club
15. Loren Lown, Polk County Conservation Board staff
16. Dan Higginbottom
17. Doug Jones, State Historical Society
18. Laurie Fenimore
19. David Lange
20. Mark Mohler
21. Tom Putman, Ducks Unlimited
22. Phil Walsh
23. Merrilyn Goepel, Educator
24. Red Brannan, Polk County Conservation Board
25. Vada Babcock, Audubon Society
26. Ed Fallon
27. Howard Messerer
28. Rick Ballock
29. Randy Forsberger
30. Otis Anderson
31. Jeff Christopherson
32. Chris Christopherson
33. Doug Erickson
34. Lynn Schreurs
35. Janet Epparel



At a third committee workshop held with staff on November 5, 2002, a discussion about the composite plan developed at the community workshop occurred. Staff provided input about the composite plan and provided valuable insight into the many recommendations from the public. Dunbar/Jones staff then prepared a Preliminary Master Plan that utilized public and PCCB staff input. An additional committee workshop was held with staff on November 25, 2002. Several issues were further discussed and clarified. Following this final staff review, Dunbar/Jones pre-

pared the Preliminary Master Plan for presentation and testing by interested community members and groups.

Two additional meetings were held with staff to review and discuss the final *Chichaqua Bottoms Greenbelt Master Trails Plan*.

### PLANNING PROCESS

The goals, issues and concerns, surrounding context implications, and development criteria for the *Chichaqua Bottoms Greenbelt Master Plan* initially identified by the Steering Committee have been used as the basis for the *Master Plan*. They helped to establish the direction of the planning process for the *Chichaqua Bottoms Greenbelt Master Plan*.

### GOALS

Goals and objectives were identified for the *Chichaqua Bottoms Greenbelt Master Plan*. The primary goals and objectives include:

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#### PROTECT THE CHICHAQUA BOTTOMS GREENBELT

- Protect this area in central Iowa
- Provide protection in an orderly process
- Consider land availability and resource availability
- Maximize greenbelt potential to be a nationally recognized restoration area
- Determine appropriate size for the greenbelt and how to achieve
- Improve waterfowl habitat in wetland areas
- Address fauna inventory
- Identify and protect cultural sites
- Determine value statement – environmental, economic, aesthetic, etc.

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#### PROVIDE RECREATIONAL AND EDUCATIONAL OPPORTUNITIES

- Provide recreational uses that are compatible with conservation and natural resource management and will not degrade natural areas or become non-sustainable
- Manage existing and future recreational opportunities
- Provide controlled, quality hunting opportunities
- Provide dog training areas
- Provide educational programming – youth conservation camps
- Develop relationships and partnerships with educational institutions for study and research
- Provide continued environmental education – all ages

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#### INVOLVE THE COMMUNITY AND COORDINATE PARTNERSHIPS

- Include stakeholders in the planning process
- Create a plan for the people and for the future
- Plan for cooperative efforts between government agencies and private conservation groups

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#### DEVELOP COMPONENTS OF THE PLAN THAT WILL ENHANCE THE CHICHAQUA BOTTOMS GREENBELT

- Natural resource/land management (long-term, native vegetation, habitat restoration/development)
- Recreational opportunities
- Funding (capital, long-range, pricing, limitations, regulations, opportunities)
- Facilities
- Staffing
- Marketing
- Liability issues

### ISSUES AND CONCERNS

Issues and concerns were identified that might impact the *Master Plan*. These issues and concerns include:

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#### MANAGING THE NATURAL RESOURCES

- Address drainage issues
- Address invasive species

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#### PROVIDING NECESSARY FUNDING

- For staff and equipment
- For land purchase and restoration seed purchase
- For inventory of flora and fauna

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#### MEETING STAFFING NEEDS

- Adequate staffing to manage area
- Adequate management

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#### WORKING WITH THE PUBLIC

- Multi-agency management, communication, and responsibilities
- Determine what makes Chichaqua different from other county conservation board parks
- Public appreciation of Chichaqua

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#### DETERMINING COMPATIBLE USES

- Meet needs of recreation and conservation
- Amount of public use
- Liability associated with activities and recreation opportunities
- Deal with conflicting uses

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#### PREPARING FOR THE FUTURE

- Prepare for sprawl and impacts of adjacent housing on enjoyment of greenbelt
- Plan for predicted user growth

### STAKEHOLDERS

Stakeholders are those individuals and groups who may be affected by the project or those who can affect the project in some way. Stakeholders that need to be aware of and involved in the master plan project were identified. Stakeholders of the proposed project include:

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#### RECREATIONAL AND ENVIRONMENTAL ENTHUSIASTS

- Anglers
- Birders and butterfly enthusiasts
- Buck skinners
- Picnickers and campers
- Canoers and paddlers
- Dog trainers/groups
- Environmental educators
- Environmental programming users
- Hunters (Mid-Iowa Retriever Club and other dog hunting clubs)
- Prairie lovers
- Trail users (Des Moines Volkssport Association, hikers)
- Trappers

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**CIVIC ORGANIZATIONS**

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- Audubon Society (Audubon Iowa, Des Moines Audubon, Big Bluestem Audubon)
- Boy and Girl Scouts
- Campfire
- Ducks Unlimited
- Iowa Ornithologists Union
- Iowa Prairie Network/Native Plant Society
- Pheasants Forever
- Sierra Club (central Iowa group)
- Youth groups
- Variety of outdoor associations

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**GOVERNMENT/PUBLIC AGENCIES**

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- Natural Resource Conservation Service
- Iowa Department of Natural Resources
- Polk County Conservation Board
- Polk County Board of Supervisors
- Local governments
- Schools

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**INDIVIDUALS/PUBLIC**

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- ADA
- Families and kids
- Farmers
- Landowners
- Neighbors
- Potential other users not identified
- Rental facility users
- Volunteers

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**SURROUNDING CONTEXT IMPLICATIONS**

Outside influences on the *Chichaqua Bottoms Greenbelt Master Plan* were identified. The main surrounding context implications include:

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**BOUNDARIES AND ADJACENT LAND**

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- Definable and defensible boundaries
- Fill in gaps
- Opportunities, problems, concerns of neighbors
- Minimize encroachment from adjacent landowners not separated from roads, etc.
- Existing adjacent homes

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**ENVIRONMENTAL**

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- Production/flood sequence
- Positive benefit on flood and flood management

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**USES**

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- Area recreation value
- Taking land out of production
- Expansion possibilities – positive vs. negative
- Magnet for development

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**ECONOMIC ISSUES AND OPPORTUNITIES**

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- Replacement of agricultural ground with conservation areas will reduce the amount of federal tax dollars for farm subsidies
- Reduce FEMA dollars
- Take land off tax roles (tax base)
- Local benefit – most money has been from federal sources
- Economic opportunities outside Chichaqua Bottoms
- Area economic benefits – users spend money in the area

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**DEVELOPMENT CRITERIA**

A variety of development criteria were identified and discussed.

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**ENVIRONMENTAL AND NATURAL RESOURCES**

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- Enhance the environment
- Habitat management/development for large diversity of wildlife species (not just for one)
- Habitat for different uses – production and nesting more important than for hunting
- Limit amount of easy access into wildlife management units so not to negatively affect wildlife production or sensitive areas
- Manage large blocks of un-fragmented habitat for needs of area-sensitive wildlife
- Development should not cause harm to rare plant and animal species
- Plan for fire suppression in habitat development (fire lanes)
- Vegetation management for entire greenbelt
- Current uses for entire greenbelt
- Best utilization of water resources
- Noise should be kept to minimum
- Ability to monitor use – effect and respond
- Aesthetically pleasing development

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**FOR THE PEOPLE**

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- Increase public use
- Fun and healthy for people
- Survey public to determine future programming needs for recreation and education
- Establish and monitor recreational activity goals
- Overnight/weekend camping
- Look beyond borders for recreation offerings
- Provide for educational opportunities
- Market/promote the area
- Flexible plans that can change over time

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**COMPATIBLE USES AND COMPATIBLE WITH SURROUNDING DEVELOPMENT**

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- Compatible with existing development
- Place public uses in areas not in conflict with wildlife or sensitive natural resources
- What areas should be developed
- Create a plan that considers surrounding areas and recreation offered
- Segregated uses to enhance compatibility
- Non-polluting
- Provide affordable development

Goals, issues and concerns, outside influences, and development criteria were reviewed and discussed at meetings and workshops. Throughout the planning process, the goals, issues and concerns, and development criteria helped the focus to remain on what is important for the *Chichaqua Bottoms Greenbelt Master Plan*.



Floodplains at Chichaqua are nearly level lowlands adjacent to the river channel. These plains are submerged when the river channel carries excess water from heavy snowmelt or rains. Prior to the Skunk being straightened and leveed, erosion and deposition took place in the floodplains. The valley floor was often scarred with low ridges and swales marking former positions of the river channel. As the river meandered across the flat floodplain, channel cutoffs occurred leaving isolated crescent-shaped bodies of water known as oxbow lakes in the abandoned channel loops. The river channel and floodplain have not remained vertically stationary within its valley. Changes can be observed and recorded in terraces and benches located along the valley sides, that are nearly level surfaces elevated above the existing floodplain. These are remnants of earlier floodplains, abandoned when the river began a new episode of downcutting.

While most of the landforms and deposits found on the alluvial plains reflect the effects of flowing water, the influence of wind can also be seen. During seasonal low-flow conditions along the river channel in what is now Polk County, alluvial deposits emerged as sand dunes. As found along much of the northern and eastern sides of the channel, sand and silt were blown onto the floodplain and terrace surfaces as well as onto higher elevations along valley margins. Sand-dune topography has occurred downwind of the broad reaches of the valley floor, creating distinct ridges such as those found at the Sandhill Unit. On this same unit, ponds were formed in hollows or

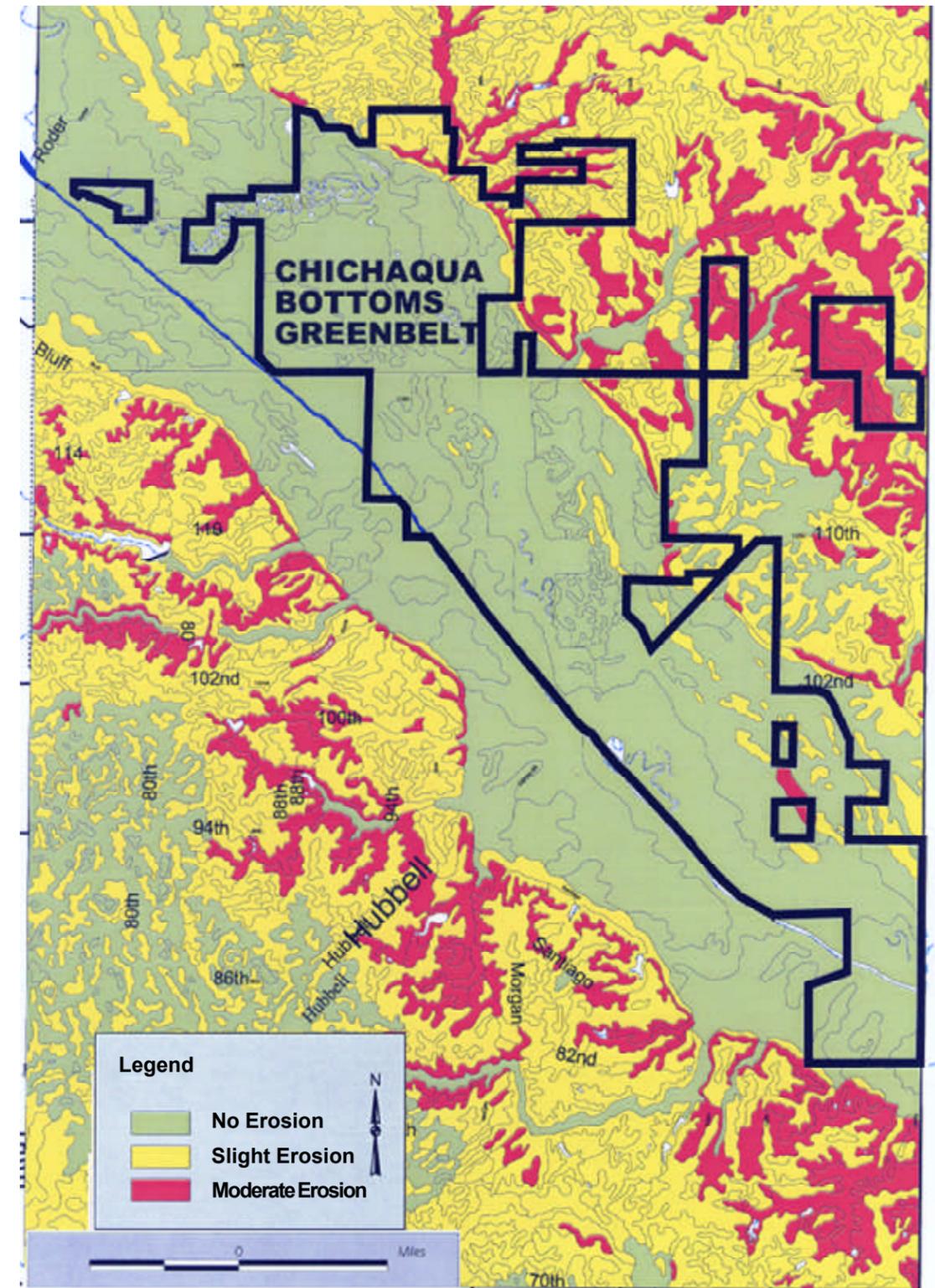


depressions among the dunes where drainage was sealed by underlying clays.

**SOILS**

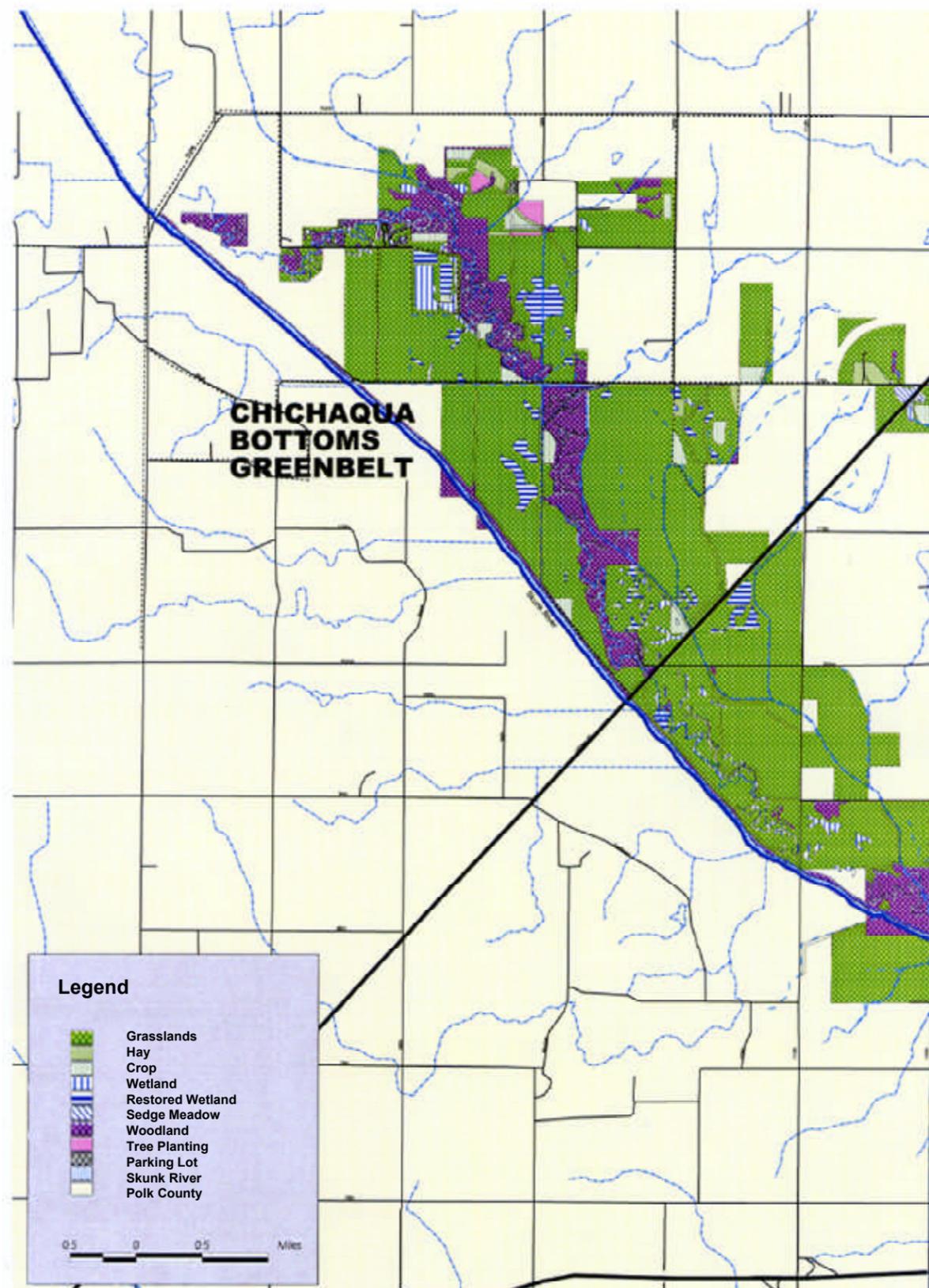
Most of the soils at Chichaqua are those of alluvial origin, found on bottomlands and secondary bottoms. These are water-deposited materials primarily silty-clay in texture, deposited by overflowing of the river.

The majority of the ridge along the eastern side of the river is made up of sandy loam soils that are well to excessively drained. These are susceptible to wind and water erosion.



SOIL EROSION MAP





VEGETATION MAP

### **VEGETATION**

Prior to settlement, the natural vegetation was primarily mixed prairie. An 1848 survey showed that uplands were rolling prairie with a scattering of oaks, elms, ash, and linden along both banks of the river. It is assumed that most of the bottoms was covered with prairie cordgrass, remnants of which are found today.

The 1985 Chichaqua Management Plan (1,241 acres) stated that floodplain timber made up 62% of the area. Grasslands comprised 22% with brome grass being the dominant specie. Very few acres of prairie were found, most being scattered populations of Big Bluestem. Agricultural fields including annual grain food and cover plantings made up the majority of the remaining vegetation.

Since 1985, acquisitions have drastically changed the vegetation composition of the Chichaqua Bottoms Greenbelt. Of the 5,400 acres (6,891 acres 2003) currently managed, grasslands make up 75% of the Greenbelt, most being native warm season grasses and forbs. Woodlands comprise 17% and row crops and hay ground comprise the remaining 8%. If the expected 8,000 acres or more can be obtained in the near future, percentages of prairie, woodlands, and agricultural lands will change even more and be approximately 84%, 11 %, and 5 % respectively.

One of the main objectives of the Greenbelt is to restore existing land and new acquisitions to native pre-settlement vegetation. This includes the enhancement and establishment of prairie and wetland plant communities.

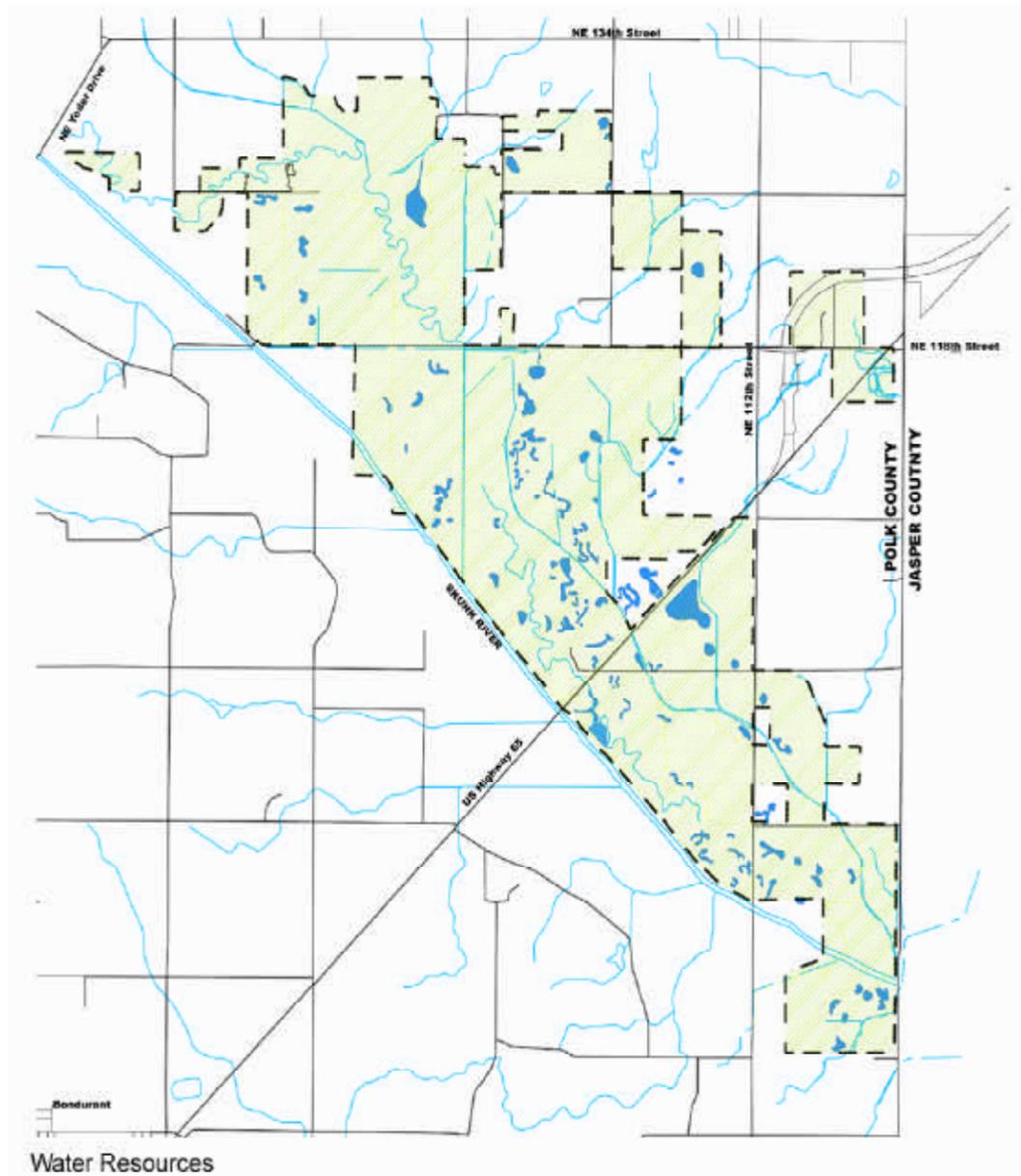
### **WATER**

Wetland types are varied and can be found in or adjacent to every management unit at Chichaqua. These include old river channels and backwaters, marshes, upland potholes, side hill seeps, and alluvial floodplain and upland drainage ways. Wetland characteristics are determined by water supplies, topography, soil types and past land use. Soil type is one of the best indicators of existing and historic wetland locations.

The main water resources are those of the original South Skunk River channel and its backwaters that run southeasterly from the Polk-Story County line into Jasper County. In the late 1800's and early 1900's in an effort to drain the adjacent farm ground, a new straightened channel was constructed in Polk County. It soon assumed the name of the Skunk River and is parallel and west of the old channel. Today, approximately 24 miles of old meandering channel can be found between the northwest end of Chichaqua and the Polk-Jasper County line, comprising nearly 44 acres.

In addition to the new channel, drainage ditches have been constructed to further drain the river bottom. Drainage Ditch No. 4 was built northwest of Chichaqua flowing parallel to the east of the old channel and outletting into the old channel northeast of the office. Drainage Ditch No. 38 was constructed in the early 1920's along the southern one-half of the old channel in the county. It dumps into the new channel at the Polk-Jasper County line. Drainage Ditch No. 52 was built in the early 1950's to bypass a portion of the old channel flowing directly into the new Skunk River. Other ditches and natural waterways also drain uplands and outlet into the above ditches.

Numerous ephemeral and semi-permanent marshes are located throughout Chichaqua. Many of these are found in wooded and grassland areas nearby the old river channel, probably created from natural channel changes. Since 1994, at least 11 wetlands have been restored by plugging previously installed drainage tile to drain existing basins and by removing silt from other shallow basins. Hydric soil types identified these historic basins.



Blandings Turtle (Ohio DNR)

**WILDLIFE**

Chichaqua offers excellent habitat for many species of wildlife primarily because of the diversity of vegetation species and strata. All wildlife species have slightly different requirements with regard to food, cover, and space or range. Any given species will utilize a diversity of food and cover types. Therefore, a wide variety of vegetation species and types are needed to maintain a diverse and healthy wildlife population.

The size of the area provides adequate space for virtually all current wildlife species. Such wide-ranging species as the whitetailed deer, *Odocoileus virginianus*, mink, *Mustella vison*, Blandings turtle, *Enzydoidea blandingis*, and Yellow-headed

blackbird, *Xanthocephalus xanthocephalus*, are present. Chichaqua extends over eight miles along the old channel of the Skunk River in Polk County alone. This river corridor, both wooded and grass, allows movement into and through the site. Existing and future acquisitions allow for the management of large unfragmented habitats. Large tracts of undisturbed habitat are essential for successful reproduction of area-sensitive wildlife, particularly migratory bird species. Yet, many species are attracted to edges where two or more habitats adjoin. At Chichaqua, the diversity and different sizes of various habitat types provide for the needs of the majority of wildlife species.



Northern River Otter (Lakehead Forestry)

The Conservation Board has not only relied on diversified habitat to provide a diversity of wildlife species, but also has re-introduced species to the area that once had a presence at Chichaqua. In 1993, fifteen wild turkeys, *Meleagris gallapavo*, trapped from other parts of the state were released. In 1997, twelve Northern River Otters, *Lutra canadensi*, were acquired from Louisiana and released into the old river channels. Since the release, otters have been sighted in all reaches of Chichaqua and in the new river channel.

The Greenbelt can also boast of a Great Blue Heron, *Ardea herodias*, rookery and numerous species of wetland and neotropical migrants. In 1977, the Plains Pocket Mouse, *Perognathus flavens*, an endangered species, was documented. Other species on the State's threatened and special concern list have been observed at Chichaqua.



Great Blue Heron (Mike Williams)

**MODERN HISTORY**

The Chichaqua Bottoms Greenbelt area has perhaps as much history as anywhere in the state due to its location on one of its major rivers. Iowa's rivers are its link with the past, a holdover from the days when a sea of prairie covered the state. Of that original landscape, only the rivers remain as reminders of how it looked when Native Americans roamed the land and when the first settlers arrived to claim it as theirs.

**Native Americans**

Sites within and near Chichaqua Bottoms Greenbelt have shown that early Americans from Paleo-Indian through Archaic and Woodland occupied the landscape. The Skunk Valley has been home to someone for at least 6,000 to 8,000 years. During pre-settlement days, early civilizations of woodland or mound-building Native American cultures inhabited the river valley back to 1,000 A.D. Tribes such as the Alogonquins roamed the area and called the river "Chichaqua" which meant offensive odor representing the large number of skunks that were found. Later Native American cultures also used the river for geographic landmarks. The river valley, cutting a narrow tree-lined strip through the prairie, was perhaps a neutral zone for hunting, dividing the Mesquakie (Sauk and Fox) tribes of the east from the Sioux tribes of the west. Historical accounts of Indians in the valley during the late 19<sup>th</sup> century probably refer to Mesquakies who came up the Skunk valley on hunting expeditions from their settlements in Tama County.

**Early Settlers**

Among Iowa's major rivers, the Skunk River has probably felt the impact of settlement the hardest. One of the indignities the river has suffered at the hands of the white man is its name. Interpreted from the name Chichaqua, the new settlers called the river "the Skunk." An early map charting the river in 1810 even called it the Polecat River.

**Chichaqua Bottoms Greenbelt Master Plan**



In the early days of white settlement, the valley through Polk and Jasper Counties was a maze of potholes, small lakes, and swamps that was a paradise for ducks but a nightmare for settlers. In fact, some rated the river bottoms east of what is now Ankeny and Elkhart as one of the best hunting areas in the nation where “thousands of ducks, geese, prairie chickens, and brants flew in clouds during migration seasons.” Market hunters killed them by the hundreds daily.

The river was also renowned for its fish. An old account says it was “not unusual to catch some weighing 15 to 20 pounds and some as much as 50 pounds.” Most of these were presumed to be catfish, but one Muskellunge was caught near Ames that weighed over 40 pounds.

The pothole country extending into Jasper County was known from Maine to California as the dreaded “Skunk River Bottoms.” It was here that the emigrant road that later became U.S. Hwy. 6 and even later Interstate 80 dipped down out of the hills and crossed the river. It was not unusual for a wagon train to spend more than three days crossing the morass.

**Straighten the River**

To the farmers, this wetland was wasted and they banded together to drain it. In the late 1800’s, they tried to straighten the river in Polk County by using plows and oxen to dig a straight ditch and hopefully reroute the channel from its natural meandering route. When this failed, they hired a huge steam dredge that was powered by burning firewood cut from the nearby river corridor. For two years in the early 1900’s, the dredge worked its way along the Skunk valley chewing out a channel that ran nearly as straight as a hoe handle. Shortly after World War I, they backed it up with a series of levees to keep the river where they wanted it. The initial ditch destroyed adjacent wetlands and eventually thousands of acres of wetlands were drained by lowering the water table. Drainage work improved the production of row crops but was devastating to wild-life.



Farwell T. Brown Photographic Archive (Ames Public Library)

Here is the way James Earl Hall, a famed author who was born and who grew up in Colfax, described it:

“In those days (before 1900) the Skunk was a river, or at least a creek. It wandered in great loops and bends, often returning upon itself as enamored of such beautiful bird-frequented country and reluctant to leave it. In later years when monstrous ditchers and dredgers began improving the country according to their engineers’ ideas of what country should be, our meandering little river became a ditch, and those who made it so convinced everyone that a straight line is the shortest distance between two points.”



**Conservation Board Comes to the Rescue**

Fortunately, the majority of the old river channel and backwaters was too low and wet to drain and farm. In 1960, the Polk County Conservation Board acquired the first parcel of land along portions of the old channel and oxbows, soon to be named the Chichaqua Wildlife Habitat. By 1964, a total of 972 acres had been acquired from five different landowners; by 1969, acquisitions totaled 1,161 acres. In 1966, after being in existence for ten years, the Conservation Board, in its annual report, reflected on the needs and expectations of its next decade:

“By 1977, more open space will be required and more and more outdoor recreation areas and facilities. The space, the areas, we have at present may appear adequate but with shorter working days and weeks, earlier retirement, with better health and longevity, we can expect to see over-use of our parks and conservation areas, at all levels, to such an extent that they’ll cease to be open-space.”

“In the past ten years we have gone from nothing to something - - from zero acres to 2,735 acres (County wide) - - we have made commendable progress and accomplishments, if that is the yardstick we use for measurement. If we measure our future needs with what we have done during the past ten years we fall woefully short of meeting the demands”.

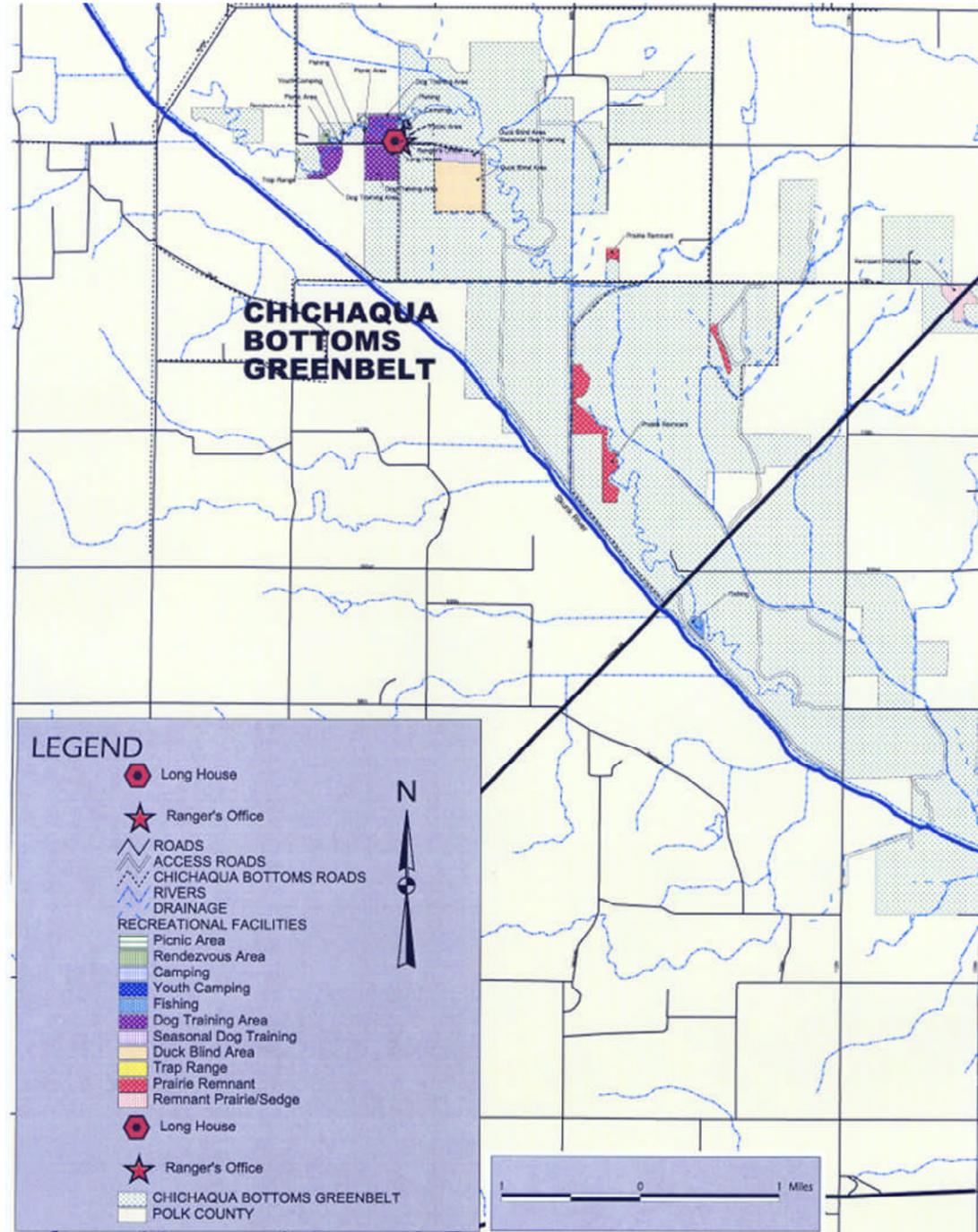
In the same report, it was recommended that the future plans for the next ten years include the expansion of present facilities with additions and development:

“At the present time the county has acquired a total of 1,161 acres for the Chichaqua project. But to complete the acquisition of the lands encompassing the old meanders of the Skunk River, approximately another 2,000 acres should be purchased. This can be considered as the major project for the next ten years, and should extend from the Story-Polk County line, southeasterly to the Polk-Jasper County line. The rehabilitation and development of the area should proceed with the acquisition.”



**New Facilities**

Acquisitions actually slowed down during the next two decades. The earlier recommendation of significant additional acquisitions would eventually be realized. Only the time frame would be off. The Conservation Board was busy, however, developing a small portion of recent acquisitions for park facilities. In 1964 a new residence and shop were constructed and during 1965 and 1966, public restrooms, a sewage system, roads, and an equipment storage building were constructed. In 1970 a steel Quonset building was moved to Chichaqua and renovated as an enclosed shelter.



RECREATIONAL FACILITIES

During 1973, a controlled waterfowl-hunting program was initiated, including the construction of a marsh and blinds and the drilling of two wells for a supplemental water source.

**Let's Try Straightening it Again**

During the early 1980's, in an attempt to allow better drainage of farm ground, landowners to the north of Chichaqua persuaded the Polk County Board of Supervisors to straighten and deepen the old river channel through the Wildlife Area. After starting the project without the legal authorization required by the State, Chichaqua staff vehemently objected to the imminent negative impacts that would occur from channelization - the lowering of the water table and the direct and indirect loss of adjacent wetlands, associated plant communities, and wildlife. Various State and Federal agencies, neighboring farmers to the south, and numerous environmental groups soon joined forces and publicly objected to the impact and loss of public rights at Chichaqua. The Iowa Natural Resource Council (INRC), the State regulatory agency responsible for issuing drainage permits, agreed with the environmentalists and, refusing to issue a permit, ordered the Polk County Board of Supervisors to restore the area to its condition prior to any construction. After numerous appeals by the County, the Iowa Supreme Court affirmed the ruling of lower courts and of the INRC. Construction sites were eventually restored.

**Park Facilities**

Between 1984 and 1986, the public restrooms adjacent to the shop building were renovated and shower facilities were added. During the next year, electric service was provided to eight camping sites and the shop-building interior was renovated for better energy efficiency. During the summer of 1992, a concrete bridge replaced a steel secondary road bridge located over the straightened Skunk River south of the Chichaqua office. The bridge, constructed on-site in 1910, is one of a few remaining in the Midwest using the Warren Pony Truss design. Its length is also longer than the typical bridge that was built using this design in that period. Because of its historic significance, the bridge was relocated over the old river channel at a site north of the main campground at Chichaqua.

**Flood of 1993**

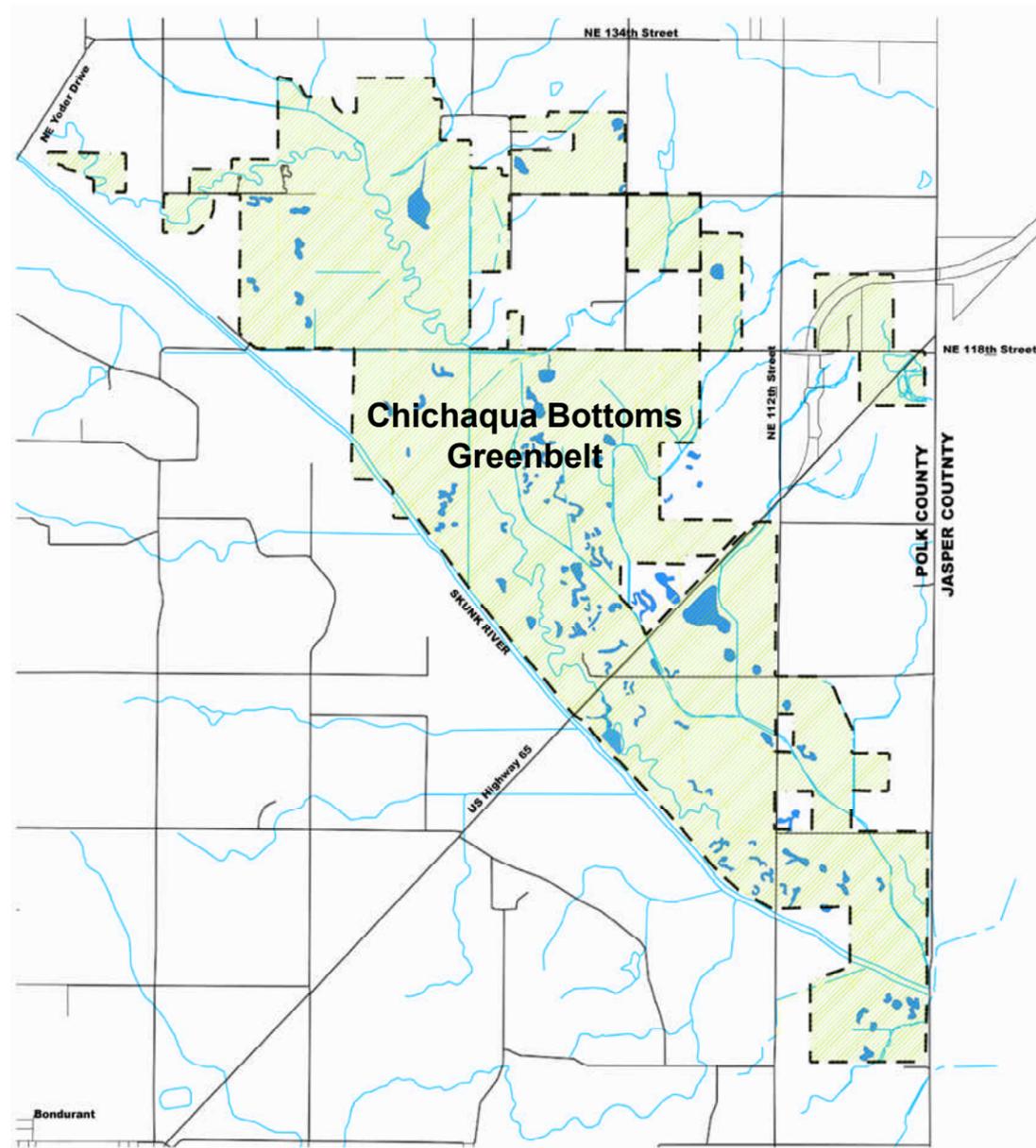
In 1993, shortly after acquiring Engeldinger Marsh and being in the process of buying the land that would later become the Sandhill Unit, the worst flooding in recorded history occurred at Chichaqua and in much of the Midwest. Considerable damage to dikes, roads, buildings, park facilities, and vegetation occurred. All of the buildings suffered damages of some kind and virtually all turf in park areas was killed because of water sitting on it for long periods of time. Many trees and shrubs were also killed or severely stressed. The majority of farm ground in the Skunk River valley in Polk County was flooded out and eight residences and numerous farm buildings were destroyed or severely damaged.



As anyone having endured flooding will tell you, the cleanup and repairs were monumental and seemed to be never-ending. Actually, the flood was somewhat of a blessing in disguise, although not realized until later. The extensive flooding allowed FEMA to fund repairs and renovation of the interior of the Area Office and the Longhouse, all desperately needed prior to flooding. Other damages were also eventually repaired and vegetation and trees were replanted.

**Chichaqua Bottoms Greenbelt Master Plan**





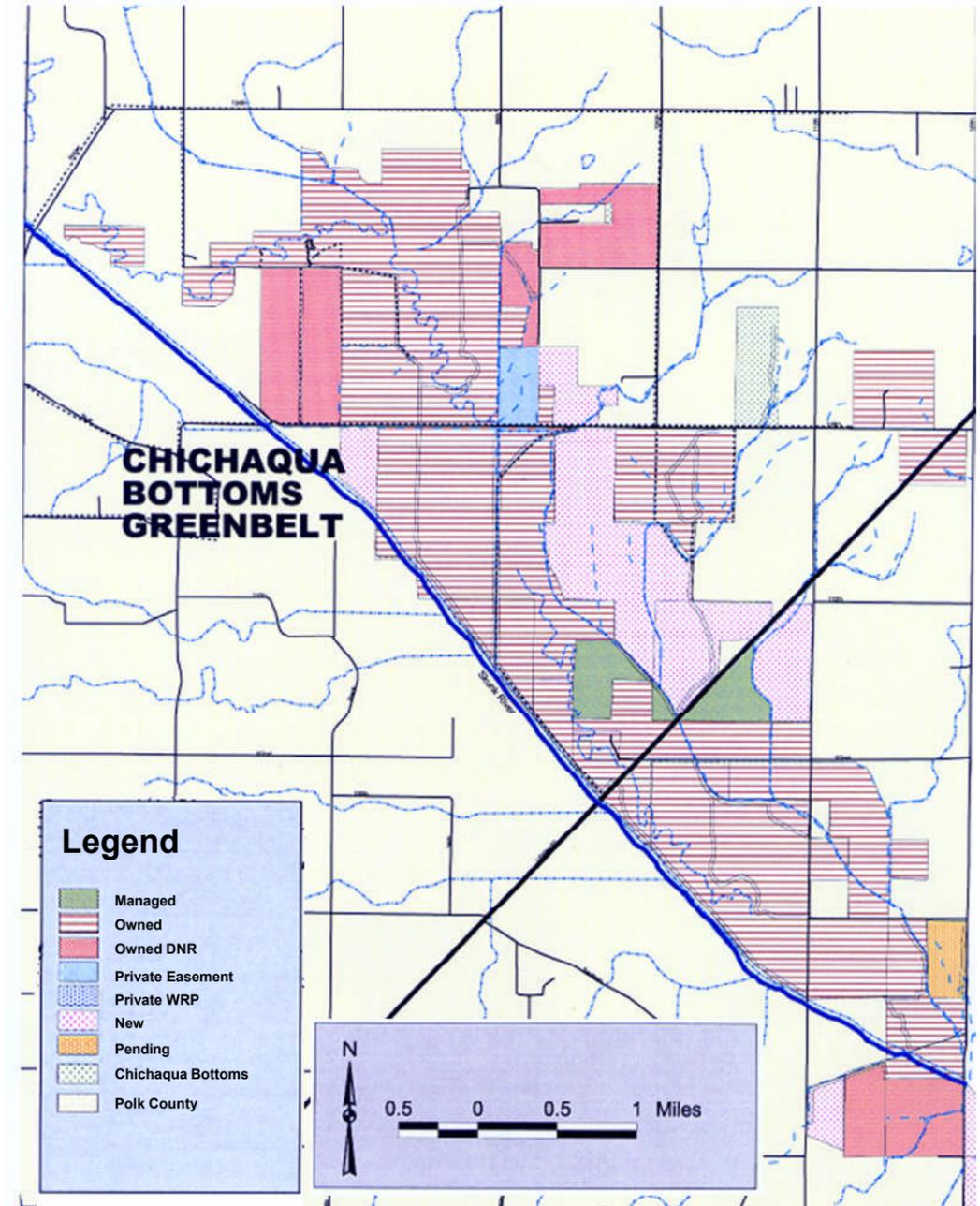
CHICHAQUA BOTTOMS GREENBELT TODAY

**Chichaqua Bottoms Greenbelt**

During the winter of 1994 when things were starting to return to normal, Conservation Board staff initiated plans to expand the Chichaqua Wildlife Area. This was in an effort to help offset the 3,000 acres of open space in the county that was being lost to urban and suburban growth each year. By joining forces with the Iowa Department of Natural Resources, the Natural Resources Conservation Service, and private conservation groups, the project soon started as an attempt to acquire and develop a large contiguous area of habitat in the northeast part of Polk County. Chichaqua would be the nucleus for the project and because its size was soon to increase, its name was changed to the **Chichaqua Bottoms Greenbelt**. With the Skunk River being an important resource in the state, it was decided to include the river valley and associated uplands from the Polk-Story County Line into Jasper County as the potential project area.

The objectives of the Chichaqua Bottoms Greenbelt were:

- To restore the hydrology to pre-settlement conditions.
- To restore new acquisitions to their native pre-settlement vegetation.
- To improve existing and to develop new habitat in an effort to increase wildlife populations and diversity.
- To provide additional areas for environmental education.
- To preserve and manage unique natural resources.
- To provide additional recreation opportunities in Polk County and central Iowa.
- To help offset the amount of open space that is lost each year to urban and suburban growth.



ACQUISITION/OWNERSHIP STATUS MAP

**Chichaqua Bottoms Greenbelt Master Plan**



Unexpectedly, the floodgates were about to really open up at Chichaqua. With the drastic economic loss experienced by those farming in major floodplains throughout the nation, the USDA's Natural Resource and Conservation Service initiated several relief programs for those farmers saddled with flood prone land. The Emergency Wetland Reserve Program (EWRP) and the Wetland Reserve Program (WRP) both offered conservation easements at the appraised land values in exchange for the conveying of cropping rights. The farmers retained title to the land but few economic uses were allowed and taxes and drainage assessment still had to be paid. Not only did these programs remove unsuitable flood prone land from production, they also removed the necessity for future Federal disaster payments.

With funding always being the largest drawback to land acquisition projects, especially ones the size of the Greenbelt, the stage was set for the Conservation Board and the IDNR to get creative. Local farm owners soon showed interest in entering their land into the Federal buy-out programs. In addition to the USDA payment for the appraised value of the land, both the County and State enticed farm owners to transfer ownership to them by offering to buy the residual values in return for the title to the land. To help the Conservation Board pay for these residual values, it became partners with and received financial assistance from private groups including the Iowa Natural Heritage Foundation, Pheasants Forever, Ducks Unlimited, Audubon Society, Izaak Walton League, Mid-Iowa Retriever Club, and others. Cost assistance was also provided from the IDNR's Habitat Stamp Fund and the U.S. Fish and Wildlife Service.

**New Species**

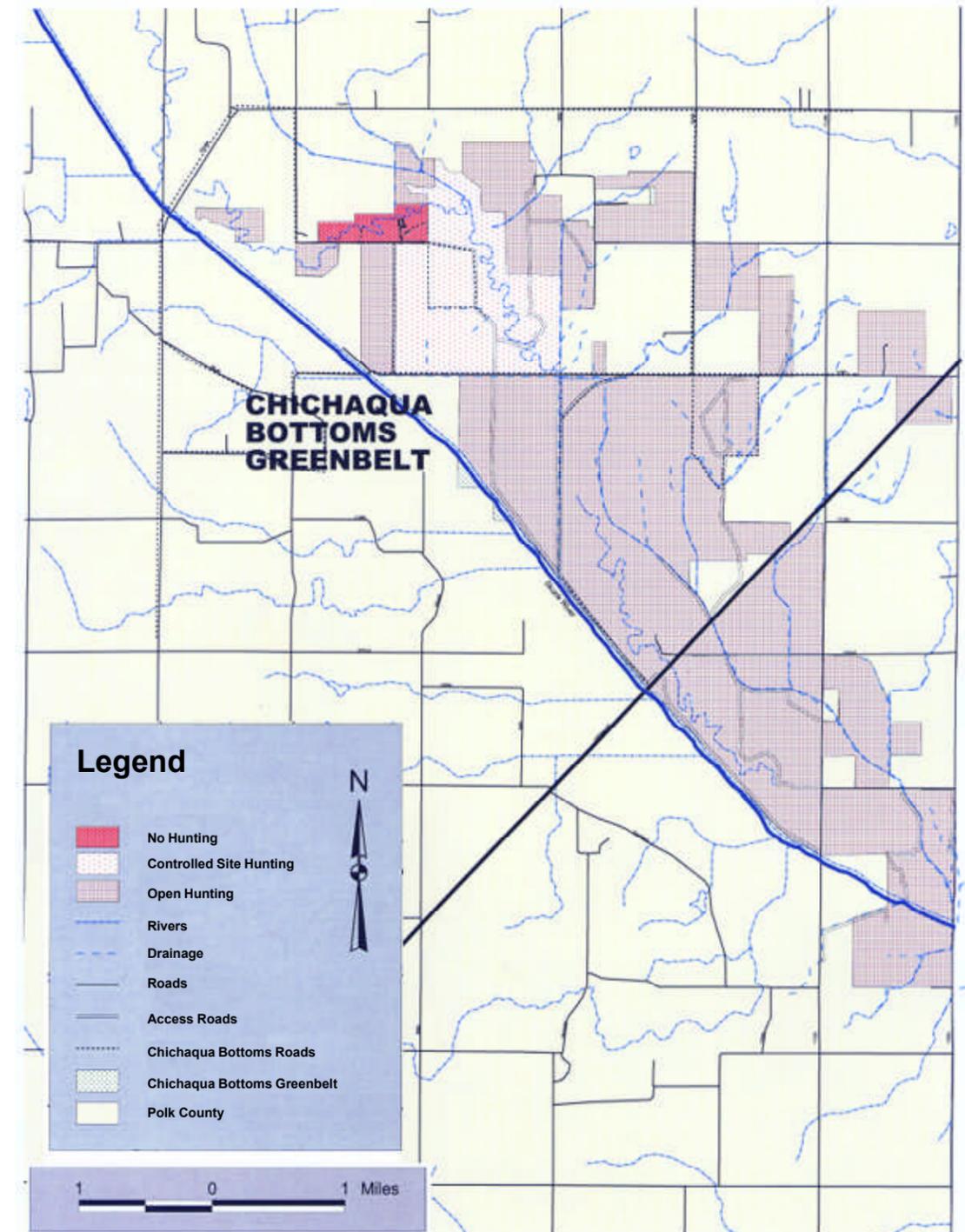
Not only was land being acquired in 1997, North American River Otters, *Lutra canadensis*, a State-threatened wildlife specie, were purchased and reintroduced to the Chichaqua Bottoms Greenbelt area. Twelve animals that were live-trapped in Louisiana were transported to and released into the old river channels, much to the delight of the public and media. Later the same year, the Plains Pocket Mouse, *Perognathus flavens*, an endangered species, was documented at Chichaqua,

**Today**

Since the beginning of the project, land acquisitions have allowed the Chichaqua Bottoms Greenbelt to more than triple in size to 6,733 acres. It is hoped that with imminent and potential County and State acquisitions in both Polk and Jasper Counties, the total acreage will exceed 8,500 acres in the next several years.

**Hunting**

Hunting has been an integral component of Chichaqua Bottoms Greenbelt almost from its establishment. Waterfowl and upland game enthusiasts have contributed to land purchases for the expansion of Chichaqua Bottoms. Hunting is allowed in all areas except the activity zone north of and along the entrance road to the campground. Controlled waterfowl site hunting exists south and east of the campground area. The desire to provide habitat for game species has directed many current management decisions including: limiting general access to some areas, food plots, grass species selection, selective mowing, controlled water levels, paid duck blinds, and duck blind reservation system.

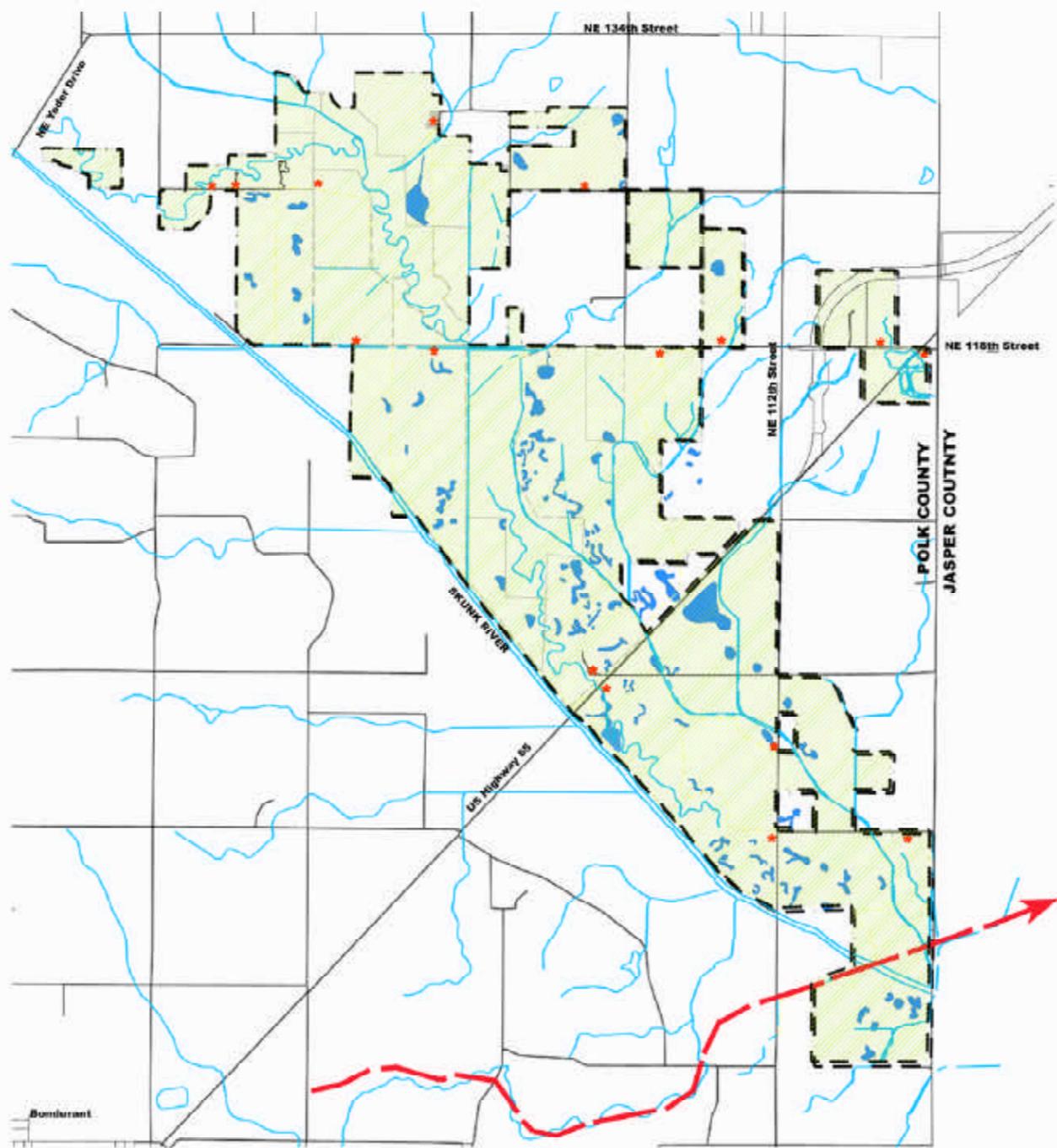


HUNTING MAP



**Transportation and Parking**

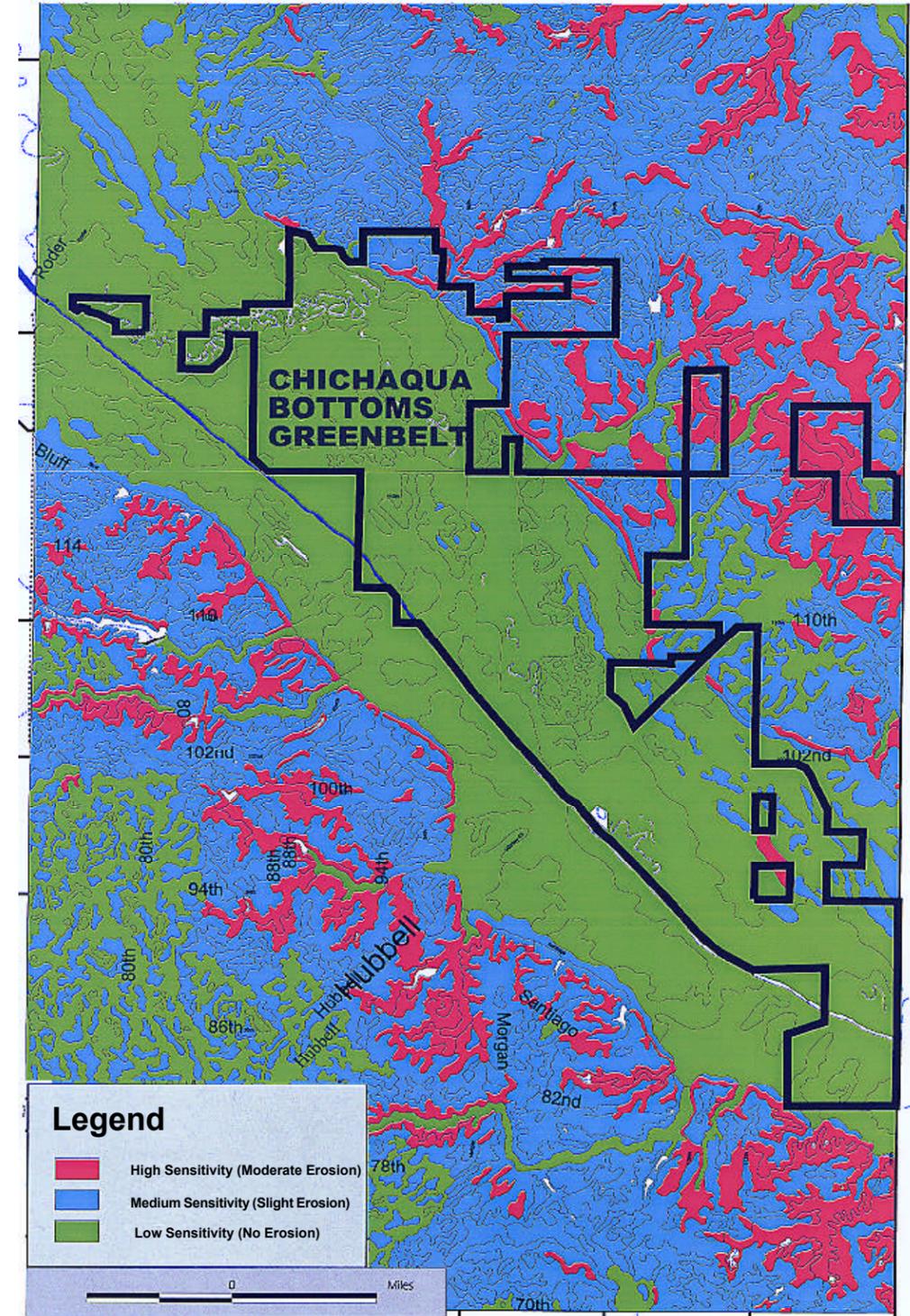
Access to Chichaqua Bottoms Greenbelt is plentiful while at the same providing large roadless areas. US Highway 65 dissects the Bottoms through the center and NE 116th Street provides access through the northern half. Other county roads run along some current park boundaries. The Chichaqua Valley trail crosses the southern end. Parking lots are strategically located throughout the Bottoms. A network of service roads provides limited vehicular access to the interior of Chichaqua Bottoms Greenbelt; service roads also serve as firebreaks. Motorized access is limited to maintenance vehicles and vehicles supporting ADA (American Disability Act) activities.



TRANSPORTATION AND PARKING

**Analysis**

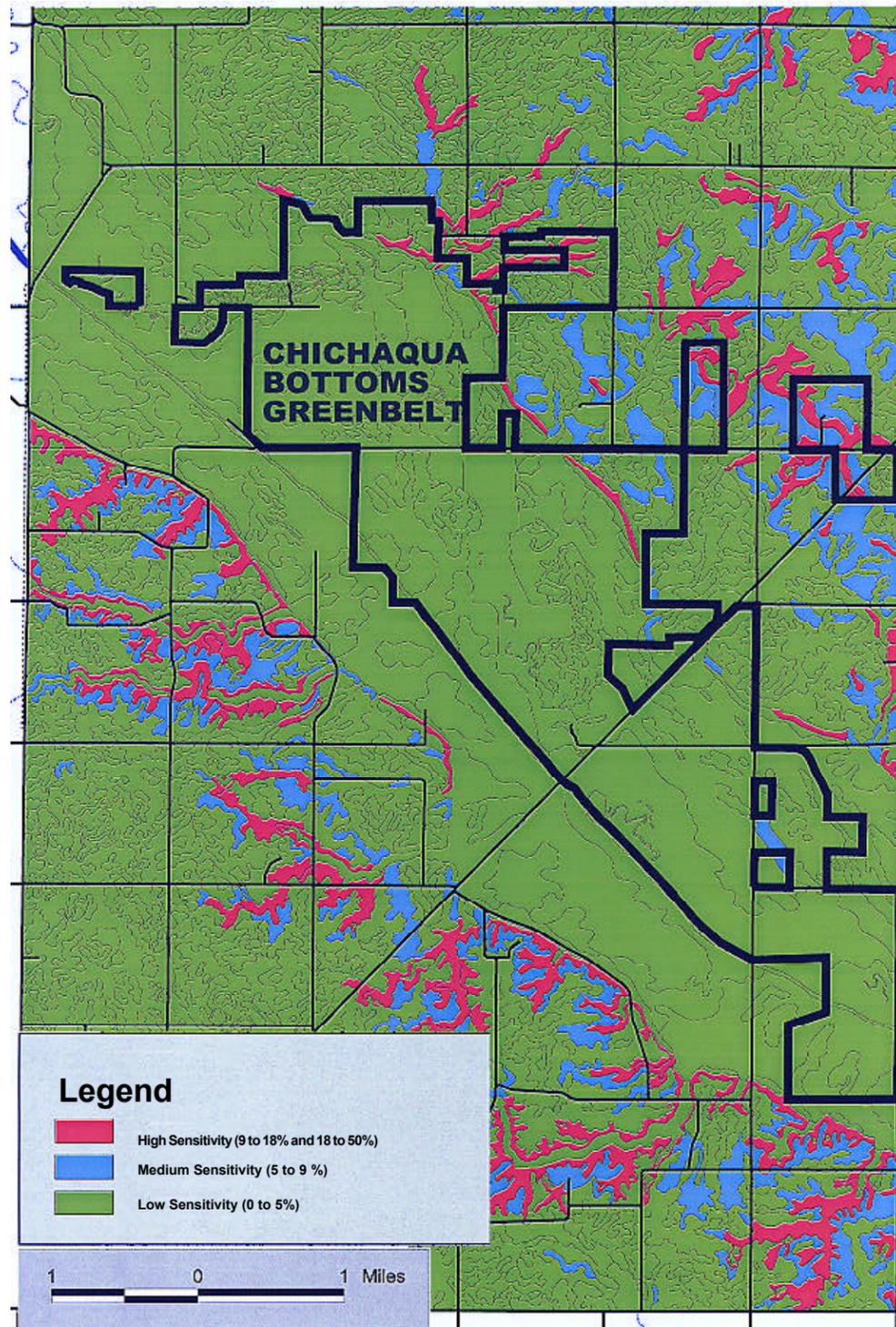
Chichaqua Bottoms Greenbelt, as identified in the inventory and analysis process, is a uniquely sensitive area of Polk County. While its modern day origins are derived from past agricultural practices and management philosophies, Chichaqua Bottoms Greenbelt remains deeply rooted in thousands of years of environmental development. Through the erosive forces of wind and water,



SOIL EROSION ANALYSIS

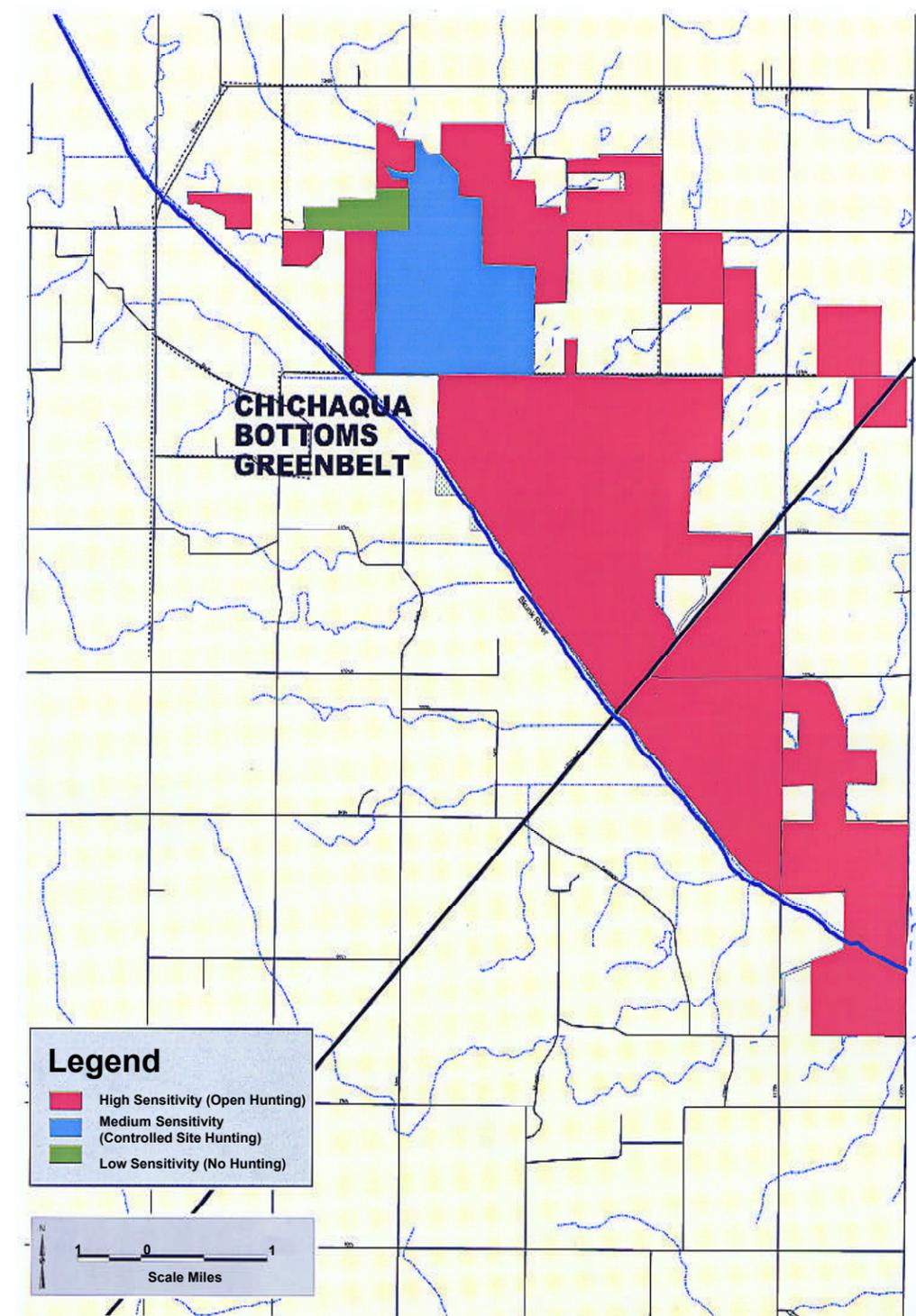
**Chichaqua Bottoms Greenbelt Master Plan**





**SLOPE RANGE ANALYSIS**

multiple ecosystems have developed ranging from wetland soils in the bottomland to highly sensitive soils in the uplands. Important remnants remain today offering snapshots of the past and providing guideposts to reestablishment of lost and greatly altered ecosystems.



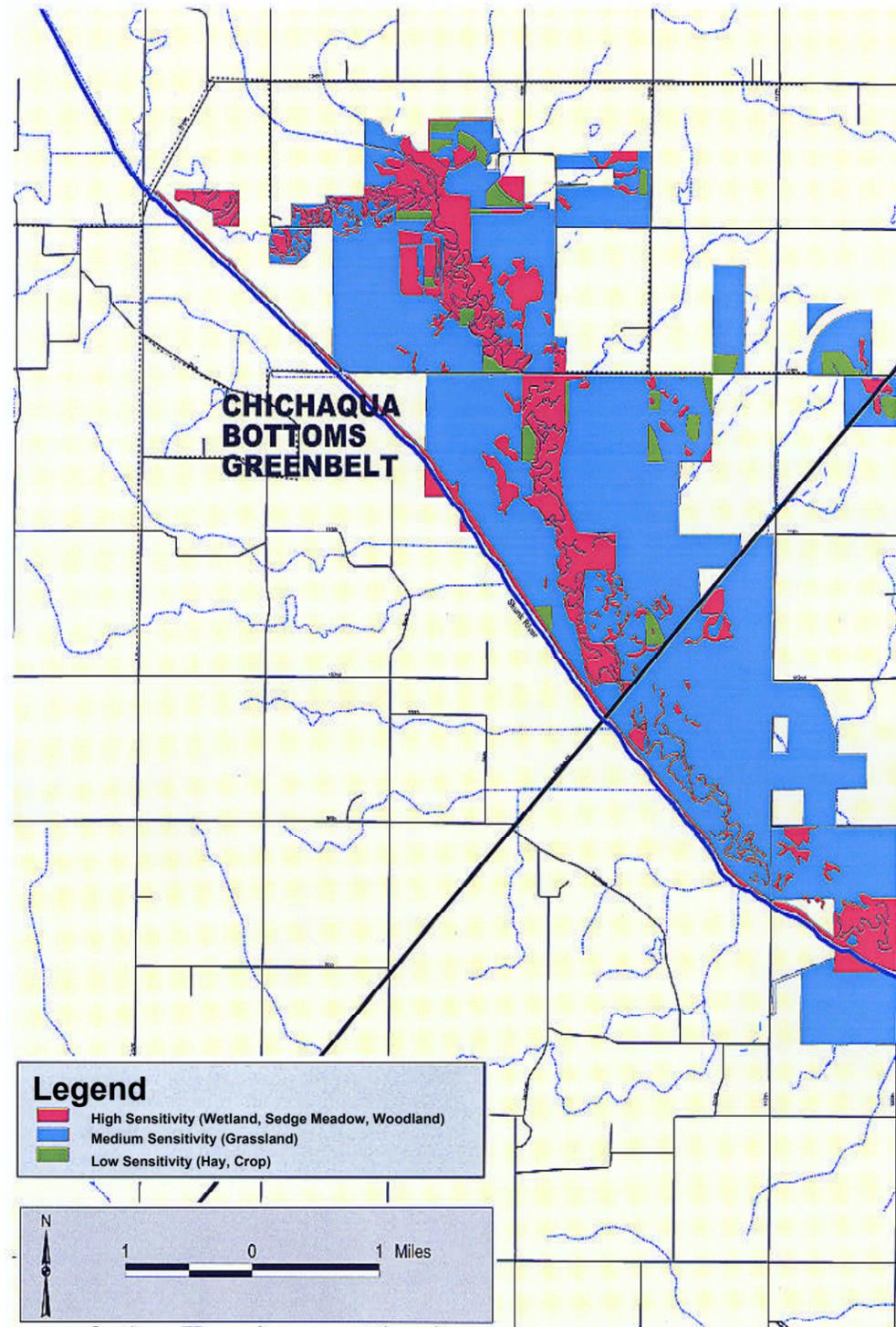
**HUNTING ANALYSIS**

Through the process of inventory gathering and data processing, the analysis phase demonstrates the overall sensitivity of the Chichaqua Bottoms Greenbelt.



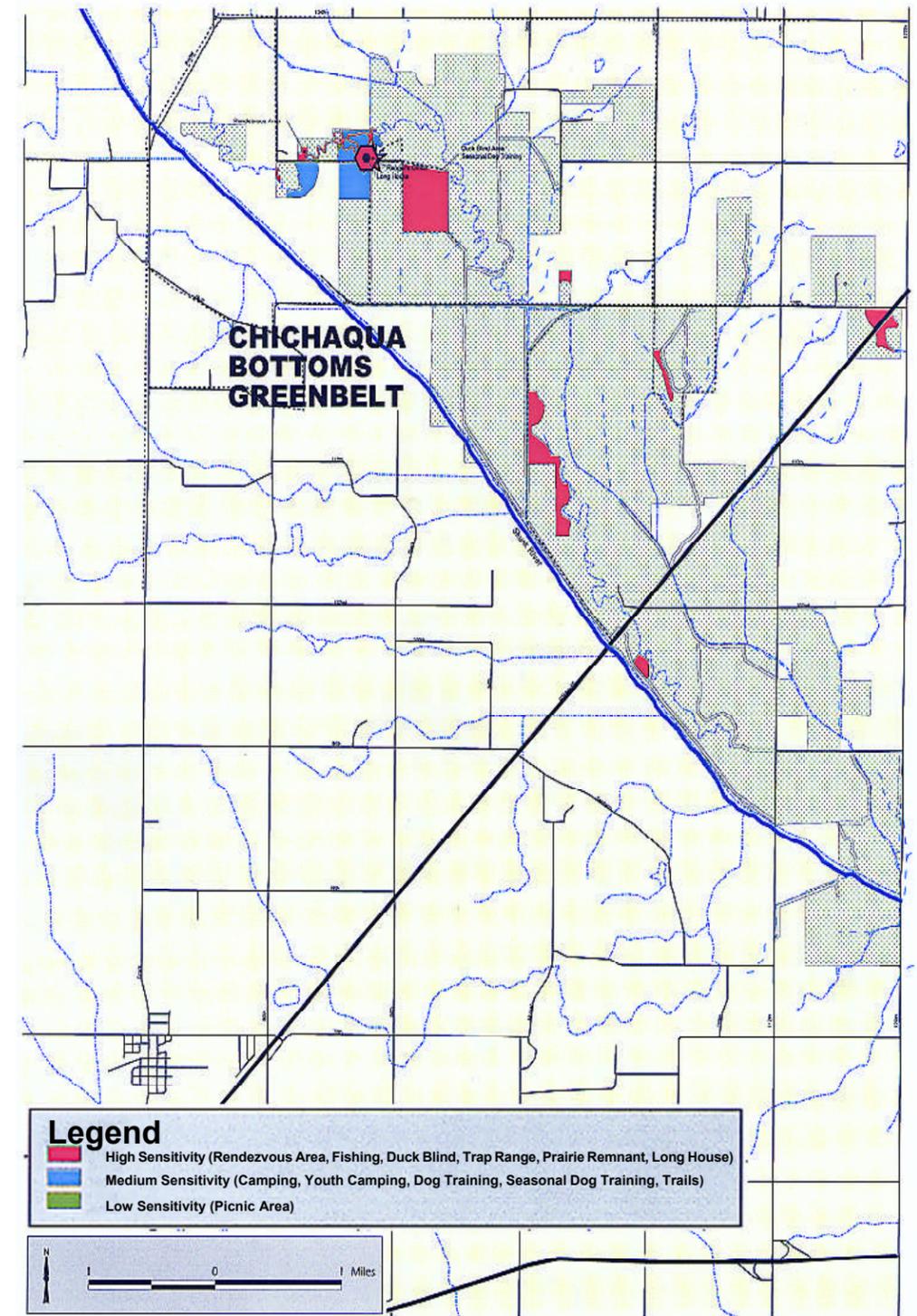
**Chichaqua Bottoms Greenbelt Master Plan**





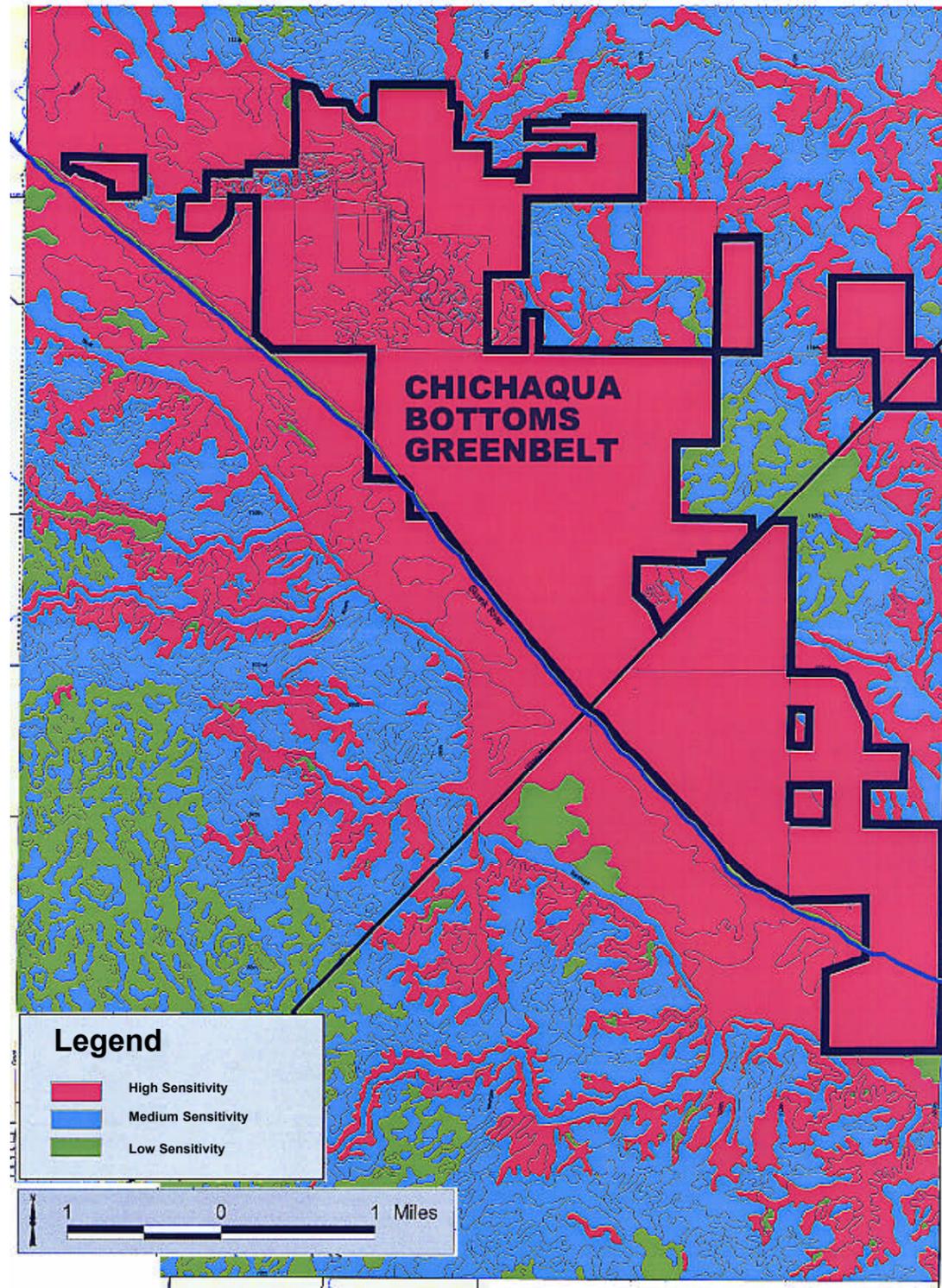
**VEGETATION ANALYSIS**

Analysis maps were prepared for Soil Erosion, Slope Range, Hunting, Vegetation, and Recreation Facilities. After completing each analysis, a composite analysis map was prepared that, not surprisingly, demonstrated that the entire Chichaqua Bottoms Greenbelt and some adjoining



**RECREATIONAL FACILITIES ANALYSIS**

properties were highly sensitive. Additional components were used in the analysis and they included the Central Iowa Greenways Plan, (Polk County Conservation Board was an active stakeholder), Acquisition/Ownership, and Flood Frequency.



CRITERIA ANALYSIS

**Conclusion**

The Critical Analysis Map was developed by overlaying and combining high sensitivity areas from the individual component maps. These high sensitivity areas were determined by analyzing the individual characteristics of the inventoried data and assigning values from engineering principles and criteria developed during the committee workshops. When reviewing specific areas of Chichaqua Bottoms Greenbelt, note that the database illustrates all areas are not sensitive. However, when combining these areas, the entirety of Chichaqua Bottoms Greenbelt becomes highly sensitive. Although this may appear to be a forgone conclusion to staff and visitors to Chichaqua Bottoms Greenbelt, the individual analysis maps will provide direction in development of specific recommendations of the *Master Plan*.

## IV. RECOMMENDATIONS

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The *Chichaqua Bottoms Greenbelt Master Plan* was developed through an extensive community input process, inventory and analysis process, and evaluation process. The existing conditions of Chichaqua Bottoms Greenbelt were evaluated and mapped. This included such information as existing geology and topography, soils, vegetation, water, wildlife, historical development patterns, recreation facilities, hunting, and transportation. Community input was gathered through three Steering Committee workshops and two community wide workshops that were open to the public. The evaluation process took place after the Steering Committee had established a program of desired uses and community preliminary mapping. The Preliminary Plan was then prepared and evaluated through the Steering Committee, public testing, and staff review.

The "Resource Management Plan" prepared by Polk County Conservation Board in 1999 also helped provide direction in the development of the *Master Plan*. This plan divided all lands north of Highway 65 into 20 management units.

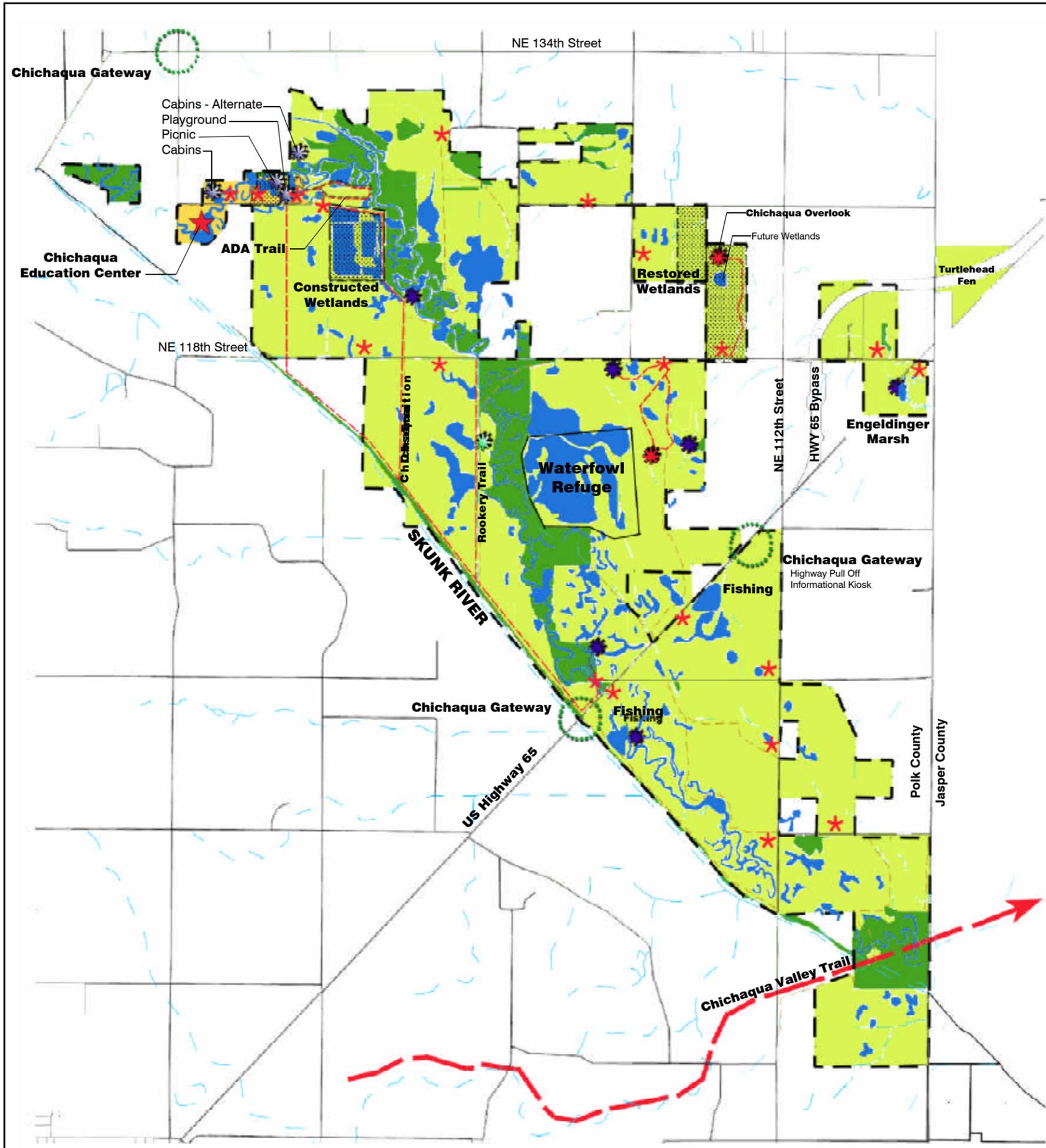
The *Chichaqua Bottoms Greenbelt Master Plan* recommends enhancements that present special places to visitors in an organized manner supporting the Polk County Conservation Board Vision Statement and the importance of land conservation, recreation, and education to the citizens of Polk County.

#### Major Recommendations:

1. Education center
2. Primitive cabins
3. Nature (foot) trails
4. Accessible (ADA) trail
5. Chichaqua observation trail
6. Gateway entrance features
7. Heron rookery preserve
8. Scenic overlooks
9. Wildlife blinds

The *Master Plan* also recommends the shooting range be closed at the current location, that it be moved to a future acquisition site to be determined as new land becomes available, primarily away from the Chichaqua Education Center activity zone. Additionally, the *Master Plan* recommends eliminating or moving the buckskinner rendezvous camp from the current location.

The following accessibility statement adopted by the Polk County Conservation Board shall be considered during the development of individual recommendations: *The Polk County Conservation Board will always continue to provide a high level of accessibility that is practical and consistent with the user's expectations in coordination with the constraints and opportunities presented by the natural environment.*



**Chichaqua Grasslands**

- Engeldinger Marsh
- Fishing
- Foot Trails
- Hunting
- Overlooks
- Seed Harvest
- Wildlife Observation
- Bird Watching

**Chichaqua Woodlands**

- ADA Trail
- Canoeing
- Education
- Fishing
- Foot Trail
- Hunting
- Bird Watching
- Wildlife Observation
- Heron Rookery

**Chichaqua Wetlands**

- Wildlife Habitat
- Education
- Engeldinger Marsh
- Waterfowl Refuge
- Hunting
- Bird Watching
- Seed Harvest
- Wildlife Observation

**Chichaqua Previously Developed**

- Chichaqua Education Center
- Camping
- Canoeing
- Fishing
- Picnic Area
- Playground
- Primitive Cabins

**Long-range Acquisitions**

- Education
- Conservation
- Preservation
- New Facilities

**LEGEND**

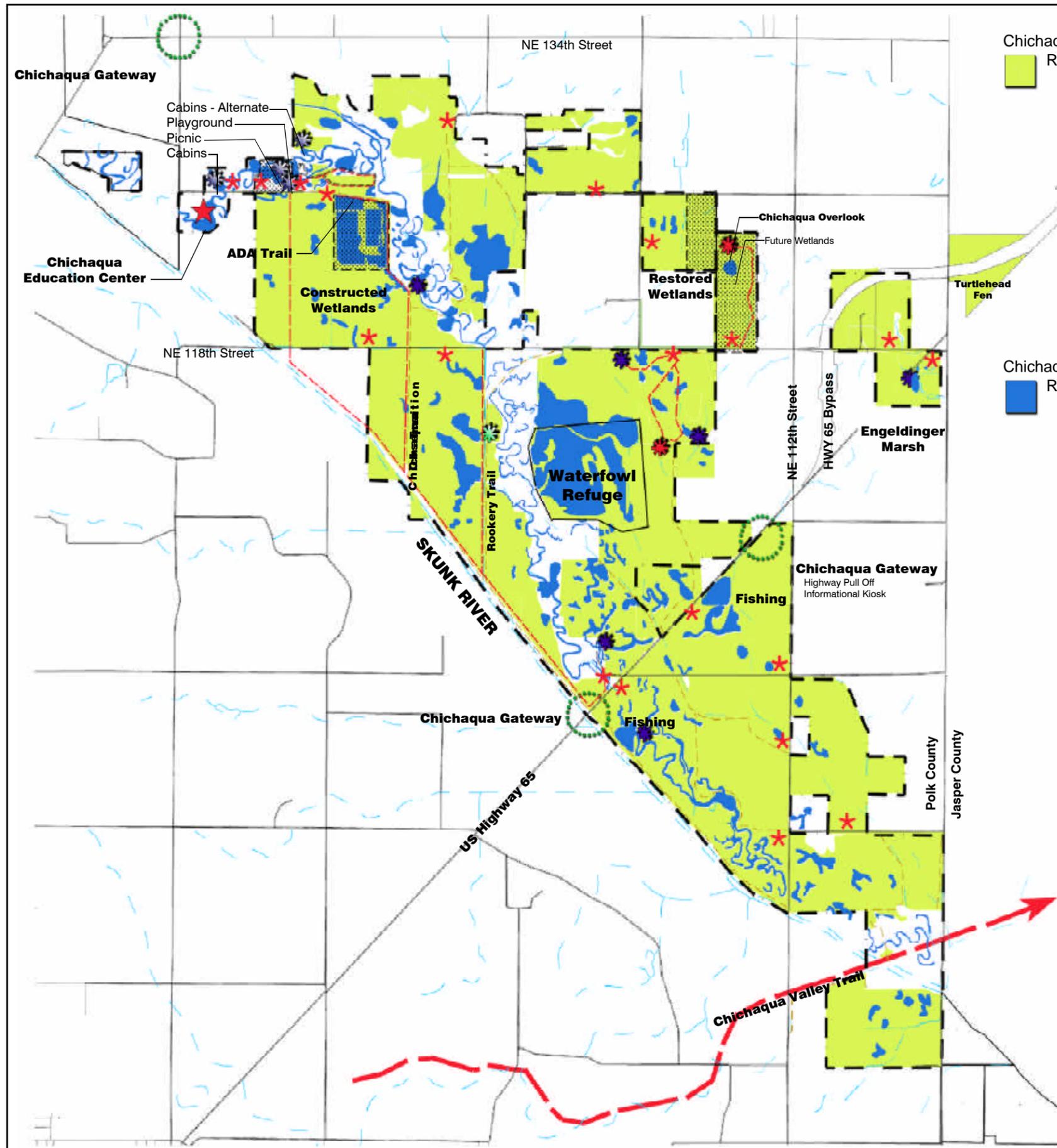
- Chichaqua Grasslands
- Chichaqua Woodlands
- Chichaqua Wetlands
- Long-range Acquisitions
- Chichaqua Previously Developed
- Chichaqua Education Center
- Chichaqua Gateways
- Chichaqua Foot Trails
- Dog Training
- Wildlife Blinds
- Rookery Blind
- Scenic Overlook
- Parking

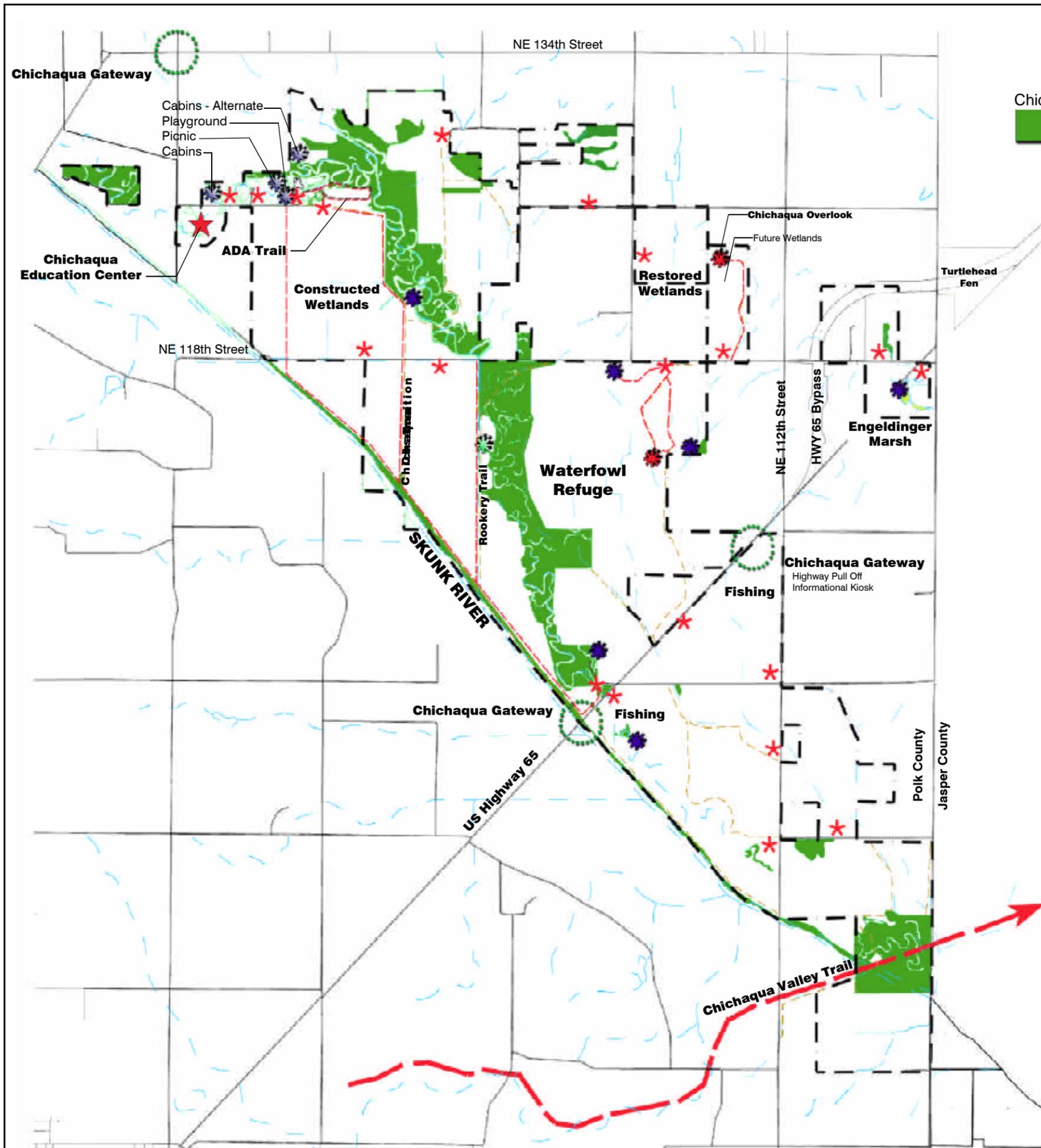


# UNIT DESCRIPTIONS

**Chichaqua Grasslands**  
**Recommendations:**  
 Comprising the largest use type of Chichaqua Bottoms Greenbelt, Chichaqua Grasslands includes both upland and restored wetland grasslands. Significant sub-units include Engeldinger Marsh, the Sandhill Unit, and a prairie remnant in management unit fourteen. Current activities include hunting, controlled site hunting, dog training, wildlife observation, wildlife habitat, environmental education, and bird watching. Proposed additional activities include a nature trail, observation overlook, wildlife blinds, seed harvesting, observation trail, and hunting dog training. A Resource Management Plan for Engeldinger Marsh has not been written. Current activities include environmental education, hunting, and bird watching. Proposed additional activities would include ADA Trail and nature trail. "Sandhill Unit" current activities include, hunting, environmental education, wildlife habitat, and wildlife observation. Proposed activities would include observation overlook, nature trail, and wildlife blinds.

**Chichaqua Wetlands**  
**Recommendations:**  
 Current activities include hunting, yearround dog training and trialing, environmental education, controlled site waterfowl hunting, duck blinds, and bird watching. Proposed activities would include dog training, ADA hunting blind, wildlife blinds, wildlife habitat, and waterfowl refuge.





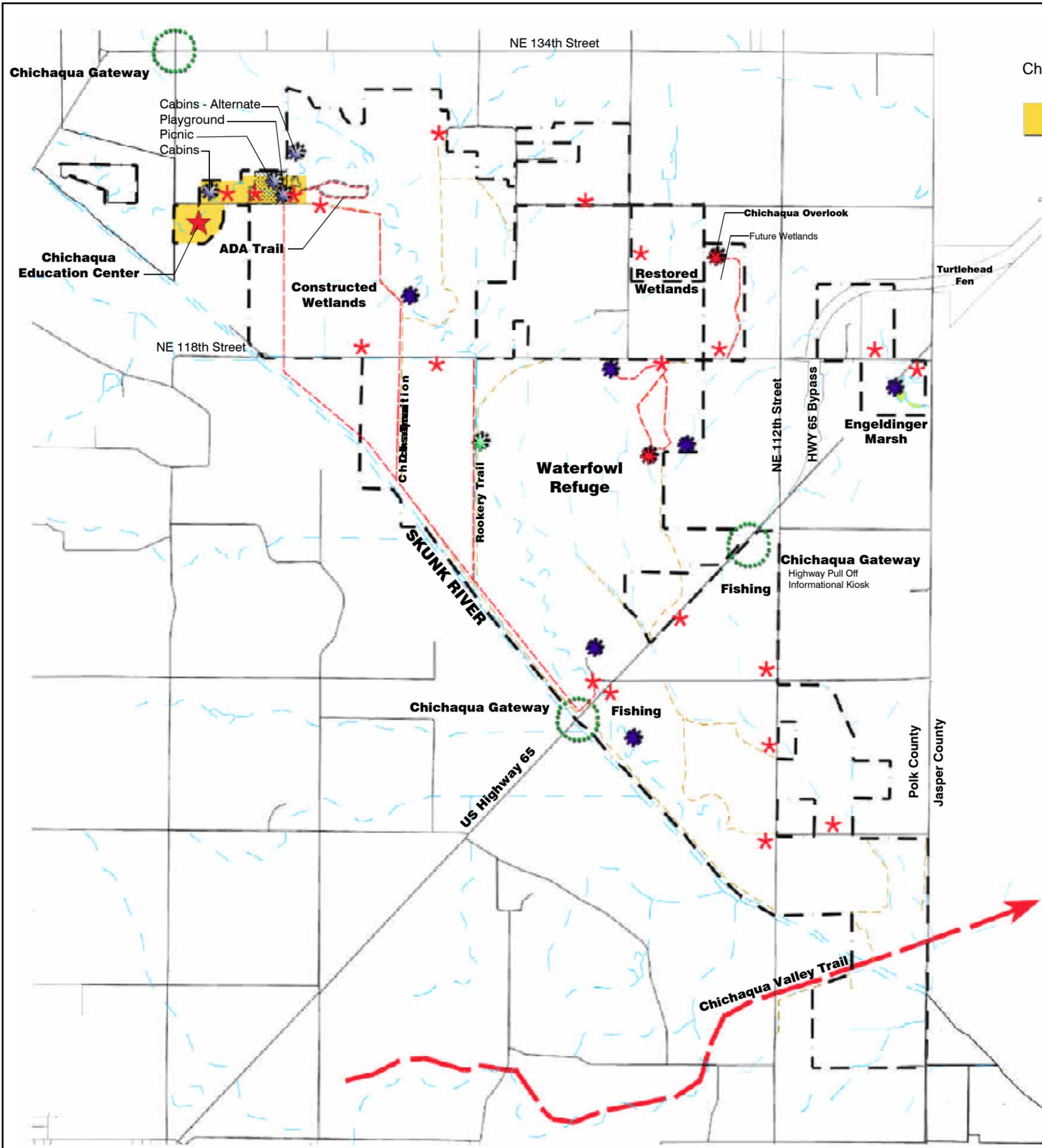
**Chichaqua Woodlands Recommendations:**

Chichaqua Woodlands preserves the Skunk River meanders and oxbows. Chichaqua Woodlands include the Heron Rookery. Current activities include environmental education, hunting, hiking, canoeing, cross-country skiing, and bird watching. Proposed additional activities would include ADA Trail and wildlife blinds. Chichaqua Woodlands preserves the heron rookery located in Management Unit 16. Current activities include, hunting, heron rookery and bird watching. Proposed additional activities would include Heron Rookery Preserve, rookery blinds, education, wildlife habitat, and wildlife preserve. Discontinued activities: hunting in the Heron Rookery Preserve.



**LEGEND**

- Chichaqua Grasslands
- Chichaqua Woodlands
- Chichaqua Wetlands
- Long-range Acquisitions
- Chichaqua Previously Developed
- Chichaqua Education Center
- Chichaqua Gateways
- Chichaqua Foot Trails
- Dog Training
- Wildlife Blinds
- Rookery Blind
- Scenic Overlook
- Parking



**Chichaqua Previously Developed**

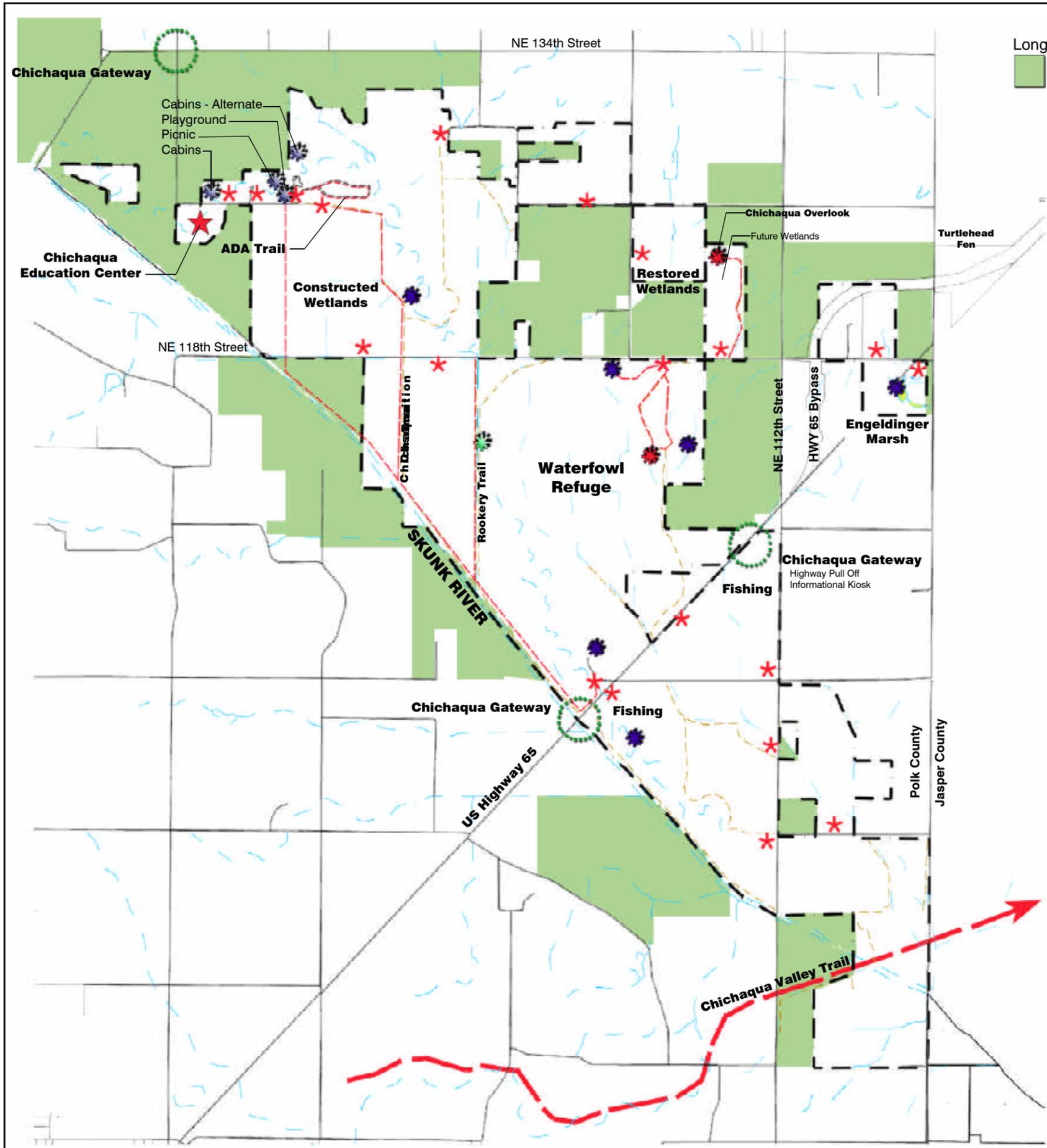
**Recommendations:**

This area contains major activity nodes for Chichaqua Bottoms Greenbelt. Current activities include camping with shower and restrooms, enclosed shelter (Long House), wildlife exhibit, nature trail head, picnicking, playground, canoeing, fishing, hiking trails, public hunting, dog training and trialing, blackpowder shooting area for demonstrations during the spring buckskinner rendezvous, wildlife observing, shop and office, ranger residence, and equipment and material storage buildings. Proposed activities would include Education Center, primitive cabins, gateway feature and signage, ADA Trail and Chichaqua Observation Trail trailheads. Discontinued activities: buckskinner's rendezvous camp, blackpowder demonstration, and shooting range.



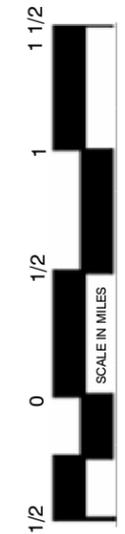
**LEGEND**

- Chichaqua Grasslands
- Chichaqua Woodlands
- Chichaqua Wetlands
- Long-range Acquisitions
- Chichaqua Previously Developed
- Chichaqua Education Center
- Chichaqua Gateways
- Chichaqua Foot Trails
- Dog Training
- Wildlife Blinds
- Rookery Blind
- Scenic Overlook
- Parking



**Long-range Acquisitions Recommendations:**

Currently Chichaqua Bottoms Greenbelt contains 6,733 acres. The Long-range Acquisition Plan identifies that it could increase to 13,450 acres. Additional woodlands and river oxbows north of Chichaqua Bottoms Greenbelt, totaling over 1,800 acres, are similar to those managed currently. Other acquisitions are a natural extension of existing property and respects small homestead ownership. Proposed additional uses would include:  
 Education  
 Preservation  
 Conservation  
 New facilities



**LEGEND**

- Chichaqua Grasslands
- Chichaqua Woodlands
- Chichaqua Wetlands
- Long-range Acquisitions
- ★ Chichaqua Previously Developed
- Chichaqua Education Center
- Chichaqua Gateways
- Chichaqua Foot Trails
- ✳ Dog Training
- ✳ Wildlife Blinds
- ✳ Rookery Blind
- ★ Scenic Overlook
- ★ Parking

## MAJOR RECOMMENDATION DESCRIPTION

### Major Recommendations:

1. **Education Center:** This facility will provide opportunities for environmental education at Chichaqua Bottoms Greenbelt. The facility would be located at the main entrance in Management Unit 2. The facility should provide opportunities to view and experience wetlands, oxbows, and grasslands. Features may include a viewing deck, outside amphitheater, large viewing windows, environmental and cultural displays, demonstration prairie gardens, conference rooms, field station, and parking lot.
2. **Primitive cabins:** Cabins within park systems in Iowa are extremely popular. They provide opportunities to experience Iowa's native treasures to individuals who do not utilize campgrounds. The primitive cabin would be developed with a minimum of creature comforts offering a place to sleep, eat and shelter. Outdoor amenities would include picnic tables, benches, walks, and parking. No plumbing would be provided, however electricity could be offered. Restroom services would be offered in a single facility, shared by all cabins.



3. **Nature (foot) Trails:** Walking throughout Chichaqua Bottoms Greenbelt is permitted. Foot trails have been designated in some potentially high traffic areas. Foot trails will utilize existing service roads with only minor upgrades anticipated. Upgrades would include directional and informational signage and minor drainage improvement with small culverts or boardwalks. Trail surface would remain as mown turf or crushed stone as required.



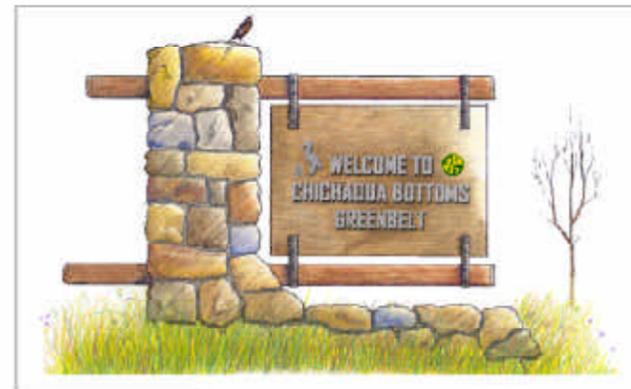
4. **Accessible (ADA) Trail:** A short loop trail is provided that would meet the requirements for disabled accessibility. The trail will originate at the campground and follow the oxbows through the wooded area. The trail surface shall be designed to accommodate wheelchairs and other mobility devices.



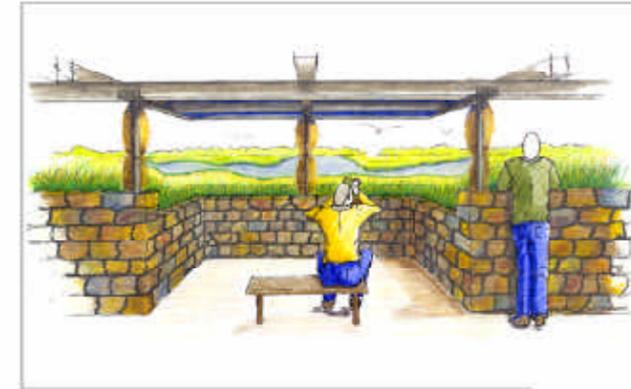
5. Chichaqua Observation Trail: Four and one-half miles of existing service roads will provide opportunities for the elderly, young families, and others with difficulties walking Chichaqua Bottoms Greenbelt with a trail ride. Utilizing a motorized tram or trailer, the observation trail would travel past constructed wetlands, the west edge of the oxbow woodlands, parallel the Skunk River, and return through one mile of unbroken grasslands. Guided by a naturalist, participants could experience many aspects of Chichaqua Bottoms Greenbelt with discussions of historical, cultural, and environmental issues of the park. By utilizing existing service roads, minimal impacts would occur. Minor improvements would include signage, drainage improvements, and trailhead kiosk. Rolling equipment would use large balloon tires to minimize soil compaction. The trail ride would operate seasonally and for special environmental educational programs.
6. Gateway Entrance Features: Traveling across the Skunk River floodplain along US Highway 65, a motorist would have no idea they were on one of the largest



publicly owned properties in the State of Iowa. Two highway monument signs would be situated at the edges of Chichaqua Bottoms Greenbelt to notify the motoring traveler they are entering the greenbelt. Constructed of fieldstones and wood, in the WPA style, they would provide a prominent announcement of the park.



7. Heron Rookery Preserve: The heron rookery will become accessible along the existing service road. While no trail improvements, other than signage and minor drainage improvements are proposed, a rookery blind is proposed overlooking the rookery from the west side of the drainage ditch. The rookery blind would be constructed of fieldstone with a camouflaged steel roof.



8. Scenic Overlooks: Two scenic overlooks are proposed, one at the Mountain Farm Unit and one at the Sand Hill Unit. The overlooks would be constructed of large boulders or fieldstone with a limestone cap forming a fireproof overlook arena. A crushed stone standing surface would be provided and it would protect the sensitive grasses at the overlook. The overlook would include signage that explains the uniqueness of the site and describes the view and vista before the visitor.



9. Wildlife Blinds: One of the most popular requests during the community workshops was for the opportunity to view wildlife, particularly birds and waterfowl. Six wildlife blinds, dispersed throughout the park, are proposed. These blinds would be constructed as described at the Heron Rookery Preserve.

## V. ESTIMATE OF PROBABLE COST

Estimates of probable costs were guided by the following assumptions:

1. Education Center: The Education Center would be a four-season, one-story building with no basement. Viewing decks would be designed for group environmental education programs and constructed from wood and stone. Site improvements would include demonstration prairie gardens with all-season walks, all-season parking lot with bio-swales to treat parking lot runoff, and outdoor environmental education signage.
2. Primitive Cabins: The cabins would be between 450-550 square feet, able to accommodate four to six visitors. Electrical service would be provided to individual cabins and a vault toilet would provide service to all cabins. Showers and modern restroom facilities would be shared with the existing campground. Access roads and parking would be crushed stone.
3. Nature (foot) Trails: These trails would be mown paths with minimal drainage improvements when required. Trails would begin and end in existing parking lots; only informational and directional signs would be added. All trails would follow existing service roads except where connections to parking lots are required.
4. Accessible (ADA) Trail: A one-mile hard surface trail six-feet wide with minor drainage improvements when required. Special viewing areas would be included to accommodate wheelchairs.
5. Chichaqua Observation Trail: Trail users would be transported along existing service roads. Special trailers designed as hayracks would be constructed and pulled with existing tractors.
6. Gateway Entrance Features: Entry features would be built on Chichaqua Bottoms Greenbelt property or on donated easements adjacent to the park. The signs would be constructed with locally acquired glacial fieldstones.
7. Heron Rookery Preserve: The Heron Rookery trail would be a mown trail on existing service roads with minor drainage improvements where required. The heron rookery blind would be constructed with fieldstones and have a steel camouflaged roof and require excavation to lower to profile of the blind.
8. Scenic Overlooks: Special construction techniques would require small construction delivery vehicles to minimize construction disturbances. Only trench excavations for footings would be permitted. Locally acquired fieldstones with quarried limestone caps would be fireproof. All information signage would be constructed within the limits of the overlook.
9. Wildlife Blinds: See Heron Rookery Blinds.
10. Parking lots: Parking lots and access drives will be construct of crush stone. Perimeter barriers would be required.
11. Signage: Trail signs, parking lot signs, and information signs are included in this category.

Park Projects	Quantity	Unit	Unit Costs	Total
Environmental education center				
Building and site	1	LS	\$100,000.00	\$100,000.00
<b>Sub-Total</b>				<b>\$100,000.00</b>
Primitive cabins				
Cabins	5	Each	\$13,000.00	\$65,000.00
Parking and drives	1	LS	\$23,000.00	\$23,000.00
Vault Toilet	1	LS	\$6,000.00	\$6,000.00
<b>Sub-Total</b>				<b>\$94,000.00</b>
Nature trails				
Trail extensions	10,000	LF	\$2.00	\$20,000.00
Drainage Improvements	1	LS	\$7,500.00	\$7,500.00
Signs	1	LS	\$8,000.00	\$8,000.00
<b>Sub-Total</b>				<b>\$35,500.00</b>
Accessible trail				
Trail surface	5,500	LF	\$2.50	\$13,750.00
Viewing areas	3	Each	\$500.00	\$1,500.00
Signs	1	LS	\$1,000.00	\$1,000.00
<b>Sub-Total</b>				<b>\$16,250.00</b>
Observation trail				
Special trailers	2	Each	\$6,000.00	\$12,000.00
Signs	1	LS	\$1,000.00	\$1,000.00
<b>Sub-Total</b>				<b>\$13,000.00</b>
Gateway features				
Signs	3	Each	\$8,000.00	\$24,000.00
<b>Sub-Total</b>				<b>\$24,000.00</b>
Heron rookery preserve				
Trail drainage improvements	1	LS	\$1,000.00	\$1,000.00
Observation blind	1	LS	\$13,000.00	\$13,000.00
Signs	1	LS	\$1,000.00	\$1,000.00
<b>Sub-Total</b>				<b>\$15,000.00</b>
Scenic overlooks				
Stone overlook	2	LS	\$13,000.00	\$26,000.00
Signs	1	LS	\$2,000.00	\$2,000.00
<b>Sub-Total</b>				<b>\$28,000.00</b>
Wildlife blinds				
Wildlife blind	5	Each	\$13,000.00	\$65,000.00
Signs	1	LS	\$1,000.00	\$1,000.00
<b>Sub-Total</b>				<b>\$66,000.00</b>
Parking lots				
Gravel parking lot	2	Each	\$8,500.00	\$17,000.00
Signs	1	LS	\$2,000.00	\$2,000.00
<b>Sub-Total</b>				<b>\$19,000.00</b>
<b>Total</b>				<b>\$410,750.00</b>

\* Does not include Administration, Design or Engineering Fees