Natural Resource Stewardship Plan
for
West Fork Management Unit

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Developed by:
Jim Weimer
Wildlife Conservationist
&
Craig Hemsath

Table of Contents

Page

3 **DEVELOPMENT OF THE NATURAL RESOURCE STEWARSHIP PLAN**

4 **INTRODUCTION AND OBJECTIVES**

6 **DESCRIPTION OF UNIT**

8 **MANAGEMENT SYSTEMS and DESCRIPTIONS**

- **Forest**
- **Open Woodland/Savanna**
- **Prairie/Grassland**
- **Developed Areas**
- **Flood Buyouts**
- **Aquatics**
- **Other**
- **Viewshed**

14 **PRACTICAL WORK PLAN**

- **High Priorities**
- **Medium Priorities**
- **Other Opportunities**
- **Equipment Needs**

17 **Definitions and Guiding Factor**

APPENDIX

Unit Maps
List of SGCN and Habitats
Agreements/Easements
Burn Units
Description of Timber Stand Improvement
Flood Buy-out Deed Restrictions

How the West Fork Management Unit was Developed

The wildlife conservationist and unit rangers are the managers of these areas and the executive director with the board's approval determine the objectives for each area. Objectives aim to address biodiversity, water quality, outdoor recreation and habitat needs of Species of Greatest Conservation Need (SGCN) along with game and non-game species. On a state-wide basis, these objectives mirror current plans such as the *Iowa Wildlife Action Plan (IWAP), Statewide Comprehensive Outdoor Recreation Plan (SCORP)*, Black Hawk County *REAP* Plan and BHCCB *Pathway* plan.

The West Fork Management Unit is comprised of the following areas: *Thunderwoman Park, Turkey Ridge Wildlife Area, West Fork Access, Fisher Forest, Shell Rock Access and flood buyout properties in Finchford.*

Management of these county properties is a cooperative effort between the wildlife conservationist and north unit manager/park ranger. The property is walked by BHCCB staff and possibly other professionals such as the state forester, wildlife biologist, and non-game biologist. The BHCCB staff and other professionals discuss the options for each system and how management of that system will fit the overall objectives for the area. The professional's recommendations (ie, state forester) are designed to manage the system to reach the objectives set forth by the wildlife conservationist, unit ranger, executive director, and board.

Management sytems are identified by type, size, location, and include descriptions. A majority of this management unit is characterized as lowland/floodplain forest and fairly undeveloped. A major component of this plan will be the state forester's management recommendations. Special considerations will be given to SGCN and habitats as identified. These may include species such as the wood turtle or bald eagle.

Numerous management systems are specified throughout this plan. This identifies the overall management for the area and designates a guideline or 'road map' for future management activities.

Introduction and Objectives

Managers:
Vern Fish, Executive Director
Mike Hendrickson, North Unit Ranger
Jim Weimer, Wildlife Conservationist

Administrative Address:
Black Hawk County Conservation Board
1346 W. Airline Highway
Waterloo, Ia 50703

Contact Info: #319-433-7275 website - www.blackhawkcountyparks.com

Location:	**Acres**	**Legal Description**
Turkey Ridge Wildlife Area	97	Sec. 4 & 5 Union Twp., Black Hawk Co.
Thunderwoman Wildlife Area	96	Sec. 5 & 6 Union Twp., Black Hawk Co.
West Fork Access	264	Sec. 4 & 5 Union Twp., Black Hawk Co.
Fisher Forest	87.5	Sec. 4 Union Twp., Black Hawk Co.
Shell Rock Access	1	Sec. 4 Union Twp., Black Hawk Co.
Flood Buyouts (manage)	29.78	Sec. 6 Union Twp., Black Hawk Co.
TOTAL ACRES:	575.28	

Created by the Iowa General Assembly in 1956, the Black Hawk County Conservation Board is charged with managing the natural resources of the county. The time span to accomplish this ongoing task extends through the careers of many wildlife managers. The longevity factor emphasizes the need for a Natural Resource Stewardship Plan (NRSP) in order to wisely manage the counties natural resources and public wildlife areas.

There are 5 primary factors emphasizing the need for a NRSP:

1) Provide overall “picture” of the unit and to develop a “road map” for future management decisions.
2) The decline of Species of Greatest Conservation Need and common species.
3) Loss of habitat diversity and associated wildlife.
4) The loss of early successional forest stands and associated wildlife.
5) Public access availability for recreation purposes.

Objectives

In this plan, there are 4 primary objectives: 1) Creating and maintaining a high diversity of habitat types for a variety of wildlife species including SGCN, 2) Create Large Habitat Blocks, 3) Increase recreational opportunities and access and 4) Form partnerships to achieve objectives.

In this plan we have presented specific actions to reach the objectives listed above. Prairies will be maintained and diversified, forest and woodlands managed for various successional stages, aquatic resources enhanced for better water quality, and public recreation enhanced from all aspects of the work done.

This plan strives to set forth a set of guidelines that will develop an ecosystem that has a diverse set of forest, prairie, and aquatic resources with associated species. Development of a diverse landscape will benefit the greatest number of plant and wildlife species, including game and non-game species. What is critically needed reproductive habitat for one species may be useless, unproductive habitat for another.

One intriguing species is the Wood Turtle. Wood turtles are listed as endangered in Iowa and require a wide buffer zone and diverse habitats between water and agricultural. Along with clean, clear waterways, the turtles require grassy openings within wooded areas for feeding, thermoregulation, and predator avoidance. Special consideration should be given to this turtle when making management decisions as it is one of the most 'at-risk' vertebrates in Iowa.

Along with species diversity, another main objective is to increase recreational opportunities and access to the various properties. The West Fork properties provide a wide array of outdoor activities from stream and pond fishing to hunting, photography, hiking, and bird watching. By maintaining parking areas, picnic areas, and trails the ease of using these areas will improve. Properly maintained access and boundary signs will also improve the public's comfort of visiting these properties.

Partners will play an important role to help the conservation board accomplish these objectives. The IDNR will continue to be a key partner, providing expertise and possible funding. Other local conservation partners could include Pheasants Forever, National Wild Turkey Federation, Ducks Unlimited, University of Northern Iowa, Hawkeye Comm. College along with local volunteers and interested citizens.

Description of Unit

The West Fork Management Unit is located in northwest Black Hawk County near the towns of Finchford and Janesville. The unit is comprised of a total of 575.28 acres of public ground. Most of the property is located along the West Fork of the Cedar River before it joins the Shell Rock River. (See Area Map) The majority of the unit consists of floodplain and lowland forest with patches of reconstructed prairie, as well as lotic and lentic resources. The only significant upland site is found at the Turkey Ridge Wildlife Area.

Unique areas include a primitive tent camping area at Thunderwoman park, recent flood buy-out properties as well as a quarry pond at Turkey Ridge Wildlife Area. This pond is utilized by a local SCUBA diving club which has an agreement with the BHCCB (See Appendix).

Looking at 1930's aerial photographs, the area was much more sparsely wooded as well as in row crop. Historically, much of the Cedar River Valley was logged in the late 1800's and then grazed. This indicates most of the woodlands are of secondary growth or reconstructed landscapes. (Figures 1 -4)

Figure 1: Thunder Woman Park as seen in the 1930's. Old road/trail is in gray.

Figure 2: Thunder Woman Park as seen today with current access points and boundaries.

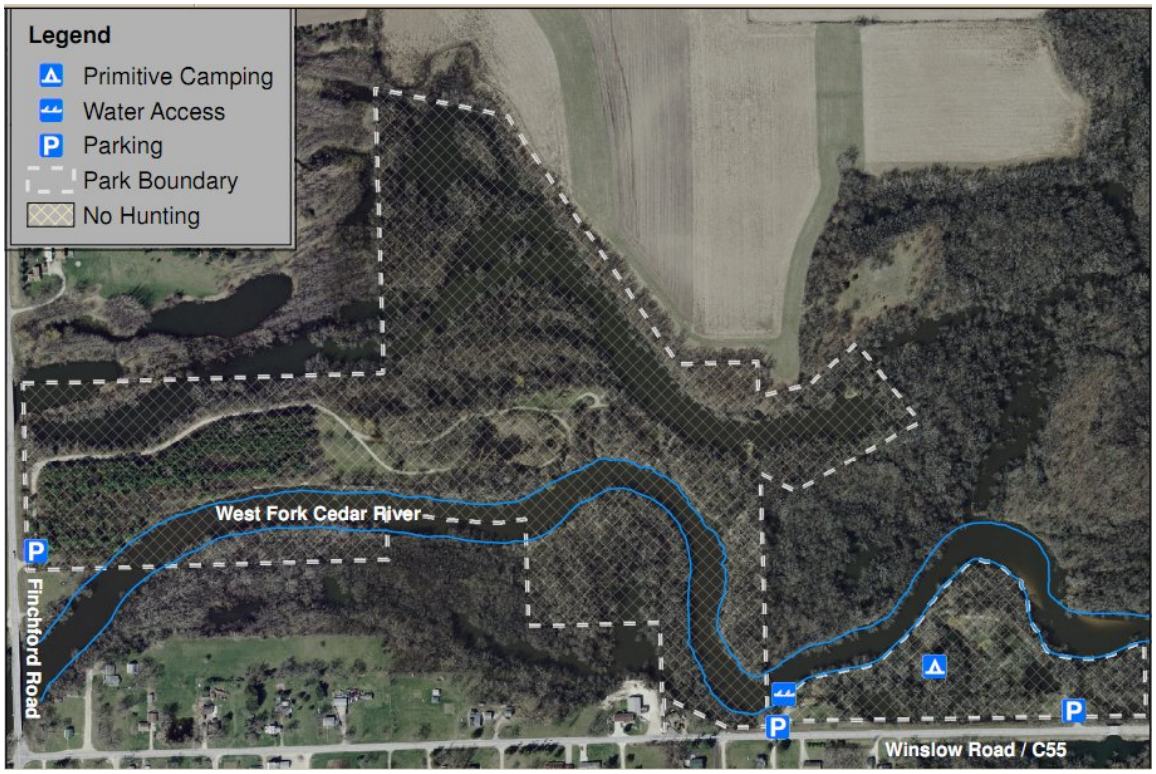
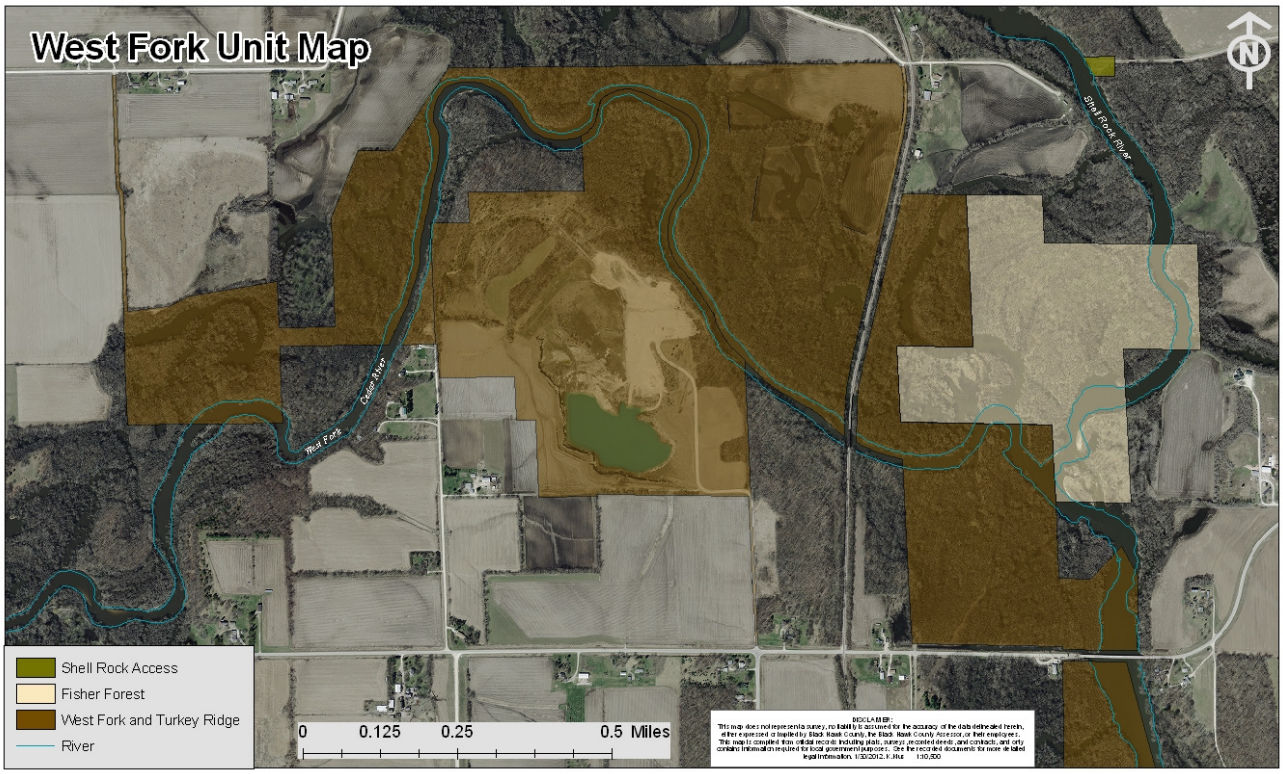


Figure 3: 1930's Turkey Ridge & West Fork Access/Fisher Forest property complex.

Figure 4: Turkey Ridge Wildlife Area, West Fork Access & Shell rock Access. Note the river channel change since the 1930's.



The lowland nature of most of these properties has left a fairly uniform soil. Much of the area is described as a Spillville-Coland complex which experiences frequent flooding. Topographically it does vary to Sparta & Finchford sandy loams in areas indicating some higher elevations. The former quarry at Turkey Ridge has created a complex soil profile. Work will continue to add in fill soil to create a more suitable habitat for reclamation and planting. (See Appendix for soil maps and descriptions)

Management Systems

Factors that helped determine the management systems used in this plan include: Current ecosystem including flora and fauna species, historical maps/photos, past land use, species inventories if any, soil type, geology, and topography. The management of these systems are based upon the objectives listed on pages 3-4.

The West Fork Unit was broken into Management Systems. The current acres for each management system are as follows:

System	Current Acres	% of total area
Upland Forest	41	7%
Floodplain Forest	412	71%
Open Woodland/Savanna	7	1%
Prairie/Grassland	49	9%
Developed Areas	20	4%
Aquatics (overlaps floodplain forest)	98	

Flood Buyouts	29.78	5%
Other	17	3%
Total	**575.78**	**100%**

To further break down the systems, the following categories were also calculated:

Category	Current Acres	% of total area
Upland	96.4	16%
Lowland	478.8	84%
Total	**575.28**	**100%**

Forest System

In 2011 the BHCCB adopted a Forest Management Vision Statement. The statement is as follows: *The overall vision for forest management in Black Hawk County parks is to actively manage timber resources for various successional forest stages and sustainable, multi-use benefits including recreation, wildlife habitat, biodiversity, and forest products while earning revenue and providing educational opportunities for the public.*

A forest community typically can be defined as having greater than 60% canopy cover with interlocking crowns. The West Fork Plan delineates between an Upland and Floodplain forest. Forest management is divided into three categories; Early Successional, Even Age, and Uneven Age. All three categories should be represented in a forest community, providing a diversity of habitat for all wildlife including SGCN. At this time the state forester has not stand mapped the unit or has given management recommendations. The foresters' recommendations will be added as an addendum to this plan in the future. The following information describes the three categories and also goes into detail on the benefits of each.

Early Successional Management

These sites typically are brushy interspersed with young trees. Species may include shrubs like dogwood and wild plum and trees such as silver maple, bur oak, walnut, ash, boxelder, and elm.

Many species of birds such as American woodcock, eastern towhee, gold winged warbler, and black billed cuckoo are dependent on early, high stem density forests. This high stem density provides critical nesting habitat and predator protection for these and other birds and wildlife.

The work typically occurs on forest edges where a good amount of sunlight is required. This will help "feather" edges and create a transitional zone from open fields to older, mature aged forests. This feathering also lessens the chance of interior nesting birds having nests parasitized by brown-headed cowbirds.

Early successional areas typically are managed on a 15 year rotation. In other words, every 15 years the area will be cut to rejuvenate the shrub stand and create more high density stands.
Proposed Early Successional Management - #___acres (Per Foresters Recommendations)

Even Age Management

Even aged management involves growing a stand of trees close to the same age. At some point in the stands life, the area is clearcut which creates the even aged structure. These cuts generally are 3-5 acres in size. Even age structure creates quality habitat for many game species such as deer, turkey, and wood ducks. The woody debris on the floor provides habitat for smaller wildlife like salamanders and reptiles.

Clearcutting is essential for oak regeneration which requires full sunlight. Floodplain forests, especially those of the Cedar and West Fork River require special emphasis on oak management. Most oaks are found on small ridges or knolls within the floodplain and these are areas where oak regeneration will be focused. In the absence of even aged stands, much of the floodplain will be lost to shade tolerant species such as hackberry, ash, elm, and boxelder. This will be detrimental from a woodland and wildlife diversity standpoint.

Each stage of an even aged forest is utilized by wildlife. During the first 15-20 years, the stand will be used by many of the same species as an early successional stand. Whereas a 20-60 year old stand will be used by canopy nesters as well as ground nesting birds. As the stand matures in the 60-125 years old range, a final compilation of birds will be found such as the pileated woodpecker, red-shouldered hawk, and prothonotary warbler.

Even aged management involves clearcutting coupled with planting or shelterwoods to develop a stand of desirable seedlings on the ground.

Shelterwood management is a type of even aged management. Several thinning cuts are done before a final clear cut. Large, healthy trees are left to provide seed to naturally reseed the stand and create partial shade in efforts to shade out weeds. Final cut occurs when there are sufficient trees in the 3-5ft range. This system may take years to develop, and the final cut does not happen until the agency is satisfied with the nurse crop.

Even age management is considered the highest level of management intensity applied to a forest. It is very labor intensive and requires long term follow up work but is essential to the future regeneration of oak trees and other sun loving trees.

Proposed Even Aged Management - # _____ acres (Per Foresters Recommendations)

Uneven Aged Management

Uneven aged stands represent trees of all sizes. The stand structure is developed by selectively harvesting some mature and defective trees every 20 years as well as any invasive trees. Since uneven stands always have large shading trees present, this system favors more shade tolerant

species such as maple, hackberry, ash, and elm. This system is not designed for oak tree regeneration.

Uneven aged management will maintain areas that will always have larger trees. This is desirable where the understory is already comprised of maples or areas where large trees will always be desired.

Uneven aged stands provide continuous tracts of woodlands with infrequent disturbance. Large tracts of uneven aged woods provide necessary habitat for migrating birds such as the cerulean, Kentucky, and blue winger warbler. Selective harvesting will also create many gaps, enhancing ground cover and stand complexity. Large, hollow, den trees can be left for wildlife habitat as well as large oaks to provide acorns for wildlife food.

Proposed Uneven Aged Management - #_____ acres (Per Foresters Recommendations)

The West Fork Unit has 41 acres designated as Upland Forest.
The West Fork Unit has 412 acres designated as Floodplain Forest

Open Woodland/Savanna

An open woodland community typically is described as an open stand of tree species with 25-60% canopy cover. Species such as white or bur oak are found in these drier, higher sites.

Some areas are more savanna like where prairie species comprise the herbaceous layer with an open canopy of oaks.

Historically fire, cutting, and grazing has kept these sites open. Fire will continue to be used to manage these stands. Frequent leaf litter fires will kill thin corked species such as maple, elm, and ironwood; whereas oaks will survive these smaller fires. Fire also exposes mineral soil, encouraging germination of acorns.

The West Fork Unit has 7 acres designated as Open Woodland/Savanna.

Prairie/Grassland

Prairie systems require more intensive management to thwart invasion of woody plants and maintain a grass and forb dominated plant matrix. The prairies may be a restored native vegetation or reconstructed farmland or other developed land. If planted, frequent mowing the first year will be utilized to improve sunlight penetration, reduce weed competition, and reduce seedling mortality.

Prairies provide critical habitat for grassland nesting birds and a host of grassland butterflies, two groups of animals that have shown to be in serious decline in recent decades. The endangered wood turtle will even use these grassy openings. Prairies also provide habitat for game species such as pheasants and partridge. The prairies also create edge areas between forest and grass. These ecotones are important for many game and non-game species.

Fire, mowing, and haying will be the primary tools to maintain the prairie systems. Fire kills most sapling trees as well as removing plant litter and debris. (See Appendix Burn Units). The opening of the ground to sunlight encourages seed germination of prairie plants. A properly timed fire is also an effective tool to combat invasive weeds such as smooth brome or reed canary grass. Interseeding of additional forb species can be done on an intermittent basis by either direct drilling or burn & broadcast into established prairies. Seeding followed by mowing that growing season will help to successfully establish new species. Increased diversity will increase food sources for pollinators as well as improve ecosystem resilience and aesthetics.

Not all grasslands the conservation board manages are comprised of native prairie species. These grasslands could also include cool season species such as smooth brome, bluegrass, or rye. Even though these species provide some ground cover, they provide very little benefits in terms of wildlife diversity and water quality. The staff will determine on a site-by-site basis whether to leave it alone or replant with NWSG (native warm season grass).

The West Fork Unit has <u>49 acres designated as Prairie/Grassland.</u>

Developed Areas

The system includes public access points but also trails, campgrounds, boat ramps, picnic areas, shelters, roads, and parking areas. Management includes mowing, signage, and general maintenance of roads, fence/gates, and other facilities. Proper and maintained access points improve the public's experience at the properties and will help maintain a

good perception of the board by the public. The Unit Ranger along with executive director, and board will determine where to prioritize resources when it involves maintaining developed areas for the public.

A major component of the High Priorities (see pg. 11-12) involves providing uniform designation with corresponding signage for the public areas. This includes designating areas as a Wildlife Area, Park, State Preserve, Refuge, or Significant Natural Area.

Possible future Accesses:
1. Small parking area off of Newell Str. For Turkey Ridge Wildlife Area
2. Boat ramp off of Finchford Rd./Winslow Rd. for West Fork of Cedar River

The West Fork Unit has 20 acres designated as Developed Areas.

Flood Buy-Outs

The historic flood of 2008 has changed many things including land/lot additions for the public. The conservation board will continue to work closely with the cities of Waterloo, Cedar Falls and other small communities to determine which sites fit the overall mission of the conservation board. In this plan, there are 6 lots totaling 29.78 acres located in the small community of Finchford that the conservation will manage (See Flood Buyout Map).

These various lot and land sizes provide small habitat blocks for wildlife and provide green, open space for the public. Future management of these sites could include maintenance mowing, a neighborhood garden, or some type of land restoration such as tree or native prairie basis on its management. This may include partnering with local neighbors on the management.

Aquatics

The West Fork Management Unit is comprised of the West Fork of Cedar River, Shell Rock River, a small lake and numerous backwaters and oxbows. The area is known for its excellent fishing, trapping, and waterfowl hunting. Statewide angler surveys have shown that interior rivers are one of the most utilized fisheries in the Iowa. These aquatic resources provide a diverse habitat for not only aquatic species but terrestrial and avian alike.

Placing fish structure

According to the first BBA (Breeding Bird Atlas) from 1985-1990 and current one in progress, there are 10 birds of Greatest Conservation Need identified in or around this unit. Some of these include the bald eagle, osprey, common nighthawk, wood thrush, and red-headed woodpecker.

To improve the fishing at Turkey Ridge lake, in 2010 man-made fish structures along with trees were place at various depths to provide cover for

game fish and their prey. (See Fish Map) These should provide excellent angling opportunities for the public all year around.

Other future aquatic projects may include:

1. Boat ramp or river access at Finchford/Winslow Rd.
2. Apply for DNR Fish Habitat money to improve fishing habitat, river access along the West Fork and fishing jetty at Turkey Ridge Lake.
3. Apply for monies to build canoe/kayak white water course on West Fork.
4. Possible future wetland mitigation sites at Turkey Ridge.

The West Fork Unit has 98 acres designated as Aquatics. (some of these acres overlap with floodplain forest acres)

Other

These are systems that do not fit into any of the ones listed in the plan. For this plan, these are areas characterized as having been heavily disturbed due to past land usage and contain low quality soils and very little to no vegetation cover or biodiversity. For example, sections of the old quarry at Turkey Ridge where, due to a lack of a soil profile and erosion there has been very little revegetation.

Over time, natural succession will very slowly take place but not necessarily of a high quality and biodiversity. When opportunities present themselves, these areas could possibly be restored by adding a soil profile and seeding with native prairie or tree species.

The West Fork Unit has 17 acres designated as Other systems.

Viewshed

An element of the landscape which viewed from an aesthetic, biological, historical, or cultural viewpoint has inherent qualities to be preserved *determined by those who view it.* These may include trails (including water trail) "right of ways," naturally scenic bluffs/valleys, and unique wildlife habitats.

Viewsheds will be taken into consideration when planning and carrying out management recommendations in the West Fork Unit understanding that a viewshed can have many meanings to many people. Under certain extenuating circumstances or emergencies (natural disasters, maintenance issues) a viewshed may not be given high priority.

Practical Work Plan

This is a flexible, working plan for the West Fork properties of BHCCB. This plan is designed to aid managers and other workers in the implementation of management guidelines and to get work accomplished on the ground. It is written in a manner that the reader has a basic understanding of land management principles, ecological theory, and natural history of the properties. Every detail is not outlined in this plan as it would become too cumbersome to be

useful. This also leaves room for current managers and the board to make discretionary changes based on the current environment or in the case of a catastrophic event.

Management Priorities

High Priority Action Items (to be completed in 1-3 years)

1) Turkey Ridge Wildlife Area - continued land reclamation of the quarry site. As it becomes available, fill needs to be brought in to cover former quarry rock. Prairie seed mix will be planted into the fill to stabilize the soil, provide wildlife (game and non-game) habitat, and add diversity to the landscape.

2) Designate areas as “Wildlife Area”, “Park”, “State Preserve”, ”Refuge”, or “Significant Natural Area”. Change signage to reflect designation. (See Definitions)

3) Signage – Inventory and map, check boundary signs, public access signs, and any other public signage. Determine signage to use, replace missing or damaged signs. Sign Fisher Forest addition.

4) Work with local cities/jurisdictions to incorporate Flood Buyouts into the county conservation board system.

5) Improve, maintain, and control public accesses – Includes adding a boat ramp to West Fork of Cedar River, parking lot off of Newell Rd., keeping trails, parking lots, and access roads open to the public.

6) Annual meeting with the local SCUBA club to review agreement.

7) Look into Wood Turtle habitat projects in partnership with Jeff Tamplin and UNI Bio. Dept.

Medium Priority Action Items (to be completed in 3-5 years)

1) Forest Management - The entire area needs stand mapped by the state forester or forestry consultant. This needs completed to finish the plan. The wooded areas of each property are to be assessed to determine future guidelines in relation to forest management. Contacts have been made to hire a forester to complete this task, but no job time frame has been determined yet.

2) Species surveys should be conducted, especially at the Fisher Forest property to determine the presence of species determined to be Species of Greatest Conservation Need. These species need to be noted in the plan and mapped if possible. As of the time this was written, a heron rookery and wood turtles have been identified as nesting and using this area.

3) Planning for habitat improvements for wood turtles and other SGCN could take place to sustain the limited population found along the West Fork. Jeff Tamplan, at UNI, has done

considerable amount of work with the turtles and could assist with any work dedicated to the turtles.

4) A continual task is the monitoring the threat of invasive species. Current problems consist of invasions such as honeysuckle, Siberian elm, crown vetch, smooth brome, buckthorn, and reed canary grass. Work should be completed on an as needed or as available basis. Working burn plans can be manipulated to accomplish specific goals (i.e. a May burn to weaken smooth brome and allow release of native seedings) or cut & treat honeysuckle while working on TSI activities.

As Opportunities Become Available

- Implement Forest Management recommendations set forth by forester, staff, and board.
- Create buffers through land acquisitions, conservation easements, forest reserve, or through some type of conservation program, for example WRP or CRP.
- Create trails through sections of the unit
- Fishing jetty at Turkey Ridge Lake
- Direct seeding hardwoods (oaks, walnuts) and planting tree seedlings to reforest sections of Turkey Ridge and West Fork Access.

Capital and Equipment Needs

Much of the equipment needed is readily available to the staff through partnerships, rental or purchase. Costs to keep in mind are maintenance & replacement costs of saws, cutters, tractors, attachments, etc.

A small log skidder would be one large capital investment that would be beneficial. As the Board moves forward with forest management, access to a logging skidder could allow for more selective harvesting of trees. If Board staff could harvest the select trees themselves, and haul to easy pickup locations for sale, the options for forest management are greatly expanded. Instead of relying solely on contracted crews, board staff could use a more 'surgical' approach on smaller areas to fine tune management.

<u>Other Equipment Needs:</u>
Skid Steer Loader
Forestry Mulcher (Fecon, Bobcat)
Log skidder
Gator with high pressure pumper unit
Disc

Forestry Mulcher

Definitions and Guiding Factors

Upland Forest – Common tree species include oak, hickory, hard maple, cherry, walnut, ash, and red cedar. Provides habitat for songbirds, deer, turkey, raptors, owls, squirrels, and furbearing predators.

Floodplain Forest – Characterized by silver maple, cottonwood, walnut, green ash, hackberry, elm, and willows. Provides habitat for songbirds, furbearers, raptors, reptiles and amphibians. It is relatively level and inundated by water occasionally.

Woodland Edge – An area of habitat transition that consists of vegetation of different heights and densities. Favors early successional vegetation for wildlife that benefit from edge cover.

Restoration – A new planting of seedlings, direct seeding, or regeneration of roots or seed bank. Create new habitat that will be of higher quality for wildlife.

Riparian Buffer – Woodland or grass/forb strip next to streams, lakes, and wetlands that is managed to enhance and protect aquatic resources from adjacent fields. Provides a vegetative cover buffer to enhance soil and water conservation while providing wildlife habitat.

Old Growth - Natural forests that have developed over long periods of time, generally at least 120 years, without experiencing severe stand replacing disturbances (severe fire, windstorm, logging). Provides habitat necessary for species requiring mature forest stands.

Significant/Unique Natural Areas – Sites that contain unusual or rare natural components that should be preserved for their unique characteristics, such as Cedar Bend Savannah or Casey Paha. The specific habitat type will guide management decisions for these uncommon areas.

Restrictions – Certain limitations or conditions on the use or enjoyment of a natural resource area. This habitat factor will take into consideration these limitations or conditions to select proper management.

Wildlife Area – Sites that will remain undeveloped, outside of safe parking areas and previous development, and managed for wildlife and game animals. Management should benefit the population of prominent game, such as additions of shelterbelts, food plots, or invasive removal. Practices will be site specific and dependent upon dominant ecosystem type. Public hunting is typically allowed at these sites

Park – These are sites that are well developed with at least some areas of manicured lawns and maintained roads. They may include campgrounds, play areas, picnic areas, and wildlife displays. They typically have much higher traffic and much higher maintenance. Public hunting is usually not allowed.

State Preserve – A natural area formally dedicated for maintenance as nearly as possible in its natural condition. Proper management to maintain its floral, faunal, scenic, geological, or

historic features will be integral to its long-term plan. May or may not be open for public hunting. This is the highest form of land protection in the state.

Refuge – Sites that are meant to be sanctuaries for various floral and faunal species. Some sites may be refuges designed to protect specific rare species, whereas others provide habitat for songbirds and all animals in general. Public hunting is not allowed on these sites.

Timber Stand Improvement – TSI is the removal of undesirable or low value trees. Removing these unwanted trees will provide more space and sunlight for desirable trees to grow. TSI is a 'weeding' to increase the growth of your forest.

Weed Tree Removal – In older timber, the undesirable species can be killed to encourage the natural reseeding of desirable species. The removal of the 'weed' trees allows sunlight to reach the ground so that seedlings can become established. The undesirable species can be killed standing by flap girdling and picloram application into the cuts. Flush cutting the trunk with cambium treatment of picloram also works. This work will not be viable during heavy sap flow during spring.

Crop Tree Release – In pole-sized (4-10" diameter) stands, potential crop trees can be selected and released. At maturity, there is room for 35-50 trees per acre. Healthy, desirable trees can be selected to comprise your future mature stand and have the area thinned around those desirables. Remove trees with crowns touching or overtopping crowns of your crop trees. Crop trees can be selected based on management criteria & objectives. Normally, crop trees are desirable species, have good form, free of major defects. These include black walnut, oaks, white ash, basswood, cherry, and hard maple.

Shelterwood – This a form of even aged management. The final cut is a clearcut, but several thinning are done prior to the final cut. The large healthy trees are left to provide seed for natural reseeding the stand, and to create partial shade to inhibit the growth of weeds and brush until desirable seedlings are well established. The final cut is normally done when there are a sufficient number of desirable trees that are 3-5 ft. tall.

The first thinning can be a killing of the undesirable species such as ironwood, elm, bitternut, and boxelder. This removes the seed source for the undesirable species and opens up the ground to sunlight.

The mature and defective trees can be harvested if additional sunlight is needed for the development of desirable seedlings. The harvest should be light, removing the trees that are deteriorating and leaving the high quality trees for seed. If possible, the defective trees could be left to create heterogeneity by adding trees that have wildlife value as nesting sites for some species.

The shelterwood system can take many years to develop a good stocking of desirable young trees. You may have to kill the undesirable species several times to favor the species you want. The final clearcut should not be made until you are satisfied with the stocking of desirable young trees.

Viewshed - An element of the landscape which viewed from an aesthetic, biological, historical, or cultural viewpoint has inherent qualities to be conserved *determined by those who view it.*

These may include trails (including water trail) “right of ways,” naturally scenic bluffs/valleys, and unique wildlife habitats.

Species of Greatest Conservation Need (SGCN) – Species that are listed as endangered, threatenend, or of special concern in the Iowa Code and also species in decline. These include game and non-game species. A complete list is found in the IDNR Iowa Wildlife Action Plan (IWAP).

Biodiversity - Biodiversity is the degree of variation of life forms within a given ecosystem, biome, or an entire planet. Biodiversity is a measure of the health of ecosystems.

Work Record

Date	Site	Man hours	Work done	Area worked (approx)	Who