

Forest Wildlife Stewardship Plan (FWSP)
Salt Creek and West Salt Creek
Wildlife Management Areas (WMAs)
Tama County



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Prepared: November 7, 2024

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INTRODUCTION

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This plan covers both the Salt Creek WMA (hereafter referenced as “East Salt Creek” WMA) and West Salt Creek WMA. These two areas are located two miles apart on either side of Vining, Iowa in Eastern Tama County. The East Salt Creek WMA is located in Section 15 whereas West Salt Creek is located in Section 20, York Township, Tama County Iowa.

The two areas comprise a total of 196 acres with 186 acres being forested, or suitable for forest (95%).

Reconnaissance surveys of East Salt and West Salt Creek WMA resources were conducted following the August 2020 derecho event and again in October of 2024. From this, the property was divided into a number of stands. Each stand represents a homogeneous unit of land which will be managed in a specific way. Stand maps with descriptions and management recommendations were developed after discussions with the WMA Biologist and other DNR staff.

The East Salt and West Salt Creek WMA FWSP is a generalized guideline for recommended management work. Detailed silvicultural prescriptions will be developed immediately prior to doing scheduled or recommended management practices in order to consider unique stand conditions and more specific targeted wildlife habitat needs. These prescriptions will be in the form of detailed practice/project plans developed with collaboration between the DNR District Forester and Wildlife Biologist. A record of completed management activities will be kept on file at the area manager’s office so that practice evaluations can be made and compared to determine if management objectives are being met and proper practice follow-up is done to determine if and when more management is needed.

FOREST RESOURCE DESCRIPTION

This plan contains forest management recommendations for 186 forested acres. The forest management areas have been divided into 15 total stands for management purposes. See the Maps Section of this plan for specific forest management stand locations.

Both of these WMA areas were hit by the August 2020 derecho wind event; however, the East Salt Creek area was hit particularly hard, with the main 28-acre ridgetop stand at the front gate being heavily decimated. Since then, the impacts to tree health caused by that destruction and by an ongoing drought have led to massive secondary die-off of oak trees throughout the mature upland areas in both WMA units. Oak decline is widespread as a result of two-lined chestnut borer attacks along with reduced vigor, age, and drought stressors.

A salvage harvest of high-value trees was quickly carried out in the winter of 2020-2021, and since then labor shortages have impacted the ability to salvage damaged and dying oak and other hardwood trees. In April 2023, a contract crew was hired to underplant 3,000 bareroot oak seedlings throughout the 28-acre main ridgetop stand at East Salt Creek to supplement natural oak regeneration. Additional work to salvage damaged and dying trees and to kill unwanted weed species in this area is still needed and will be forthcoming.

Across both WMA units, tree size classes are fairly evenly distributed.

East Salt Creek

East Salt Creek WMA has 9 stands labeled E1 through E9. Four of these stands are bottomland hardwoods occurring in the floodplain along Salt Creek. Soils in the floodplain are Colo silty clay loam on 0-2% slopes. These sites flood frequently. The other five stands are upland oak-hickory and central hardwoods forest types. In these areas, soils are Fayette and Lindley loams, which are well-drained but sensitive to compaction and erosion. Slopes can be as steep as 40% in areas.

Much of East Salt Creek has been forested continuously since the settlement era. Partial harvests can be seen in the aerial photo record going back to the 1930s, but it has been in heavy timber since at least the 1950s. Portions of the floodplain were likely used for pasture until the 1970s.

West Salt Creek

The West Salt Creek WMA has 6 stands labeled W10 through W15. Two of these stands are bottomland forest types occurring in the floodplain along Wolf Creek. The other three stands are upland areas consisting of patches of mature oak-hickory along with successional woody encroachment and invasive plants.

As the 1950s aerial photo indicates in the [maps section](#) of this plan, large areas of the West Salt Creek WMA were open hay or pasture until the 1970s or so. These have since been overrun with very dense dogwood, blackberry, invasive autumn olive and honeysuckle, and mixed native trees including cedar, ash, elm, cherry, and some oaks.

FOREST MANAGEMENT GOALS

The primary management goals for the two Salt Creek WMAs are as follows:

1. Maintain and improve overall wildlife habitat for both game and nongame species in alignment with Iowa's Wildlife Action Plan
2. Diversify the forest both in terms of species makeup and age-classes/successional stages, with a special emphasis on oaks as a keystone species as cited in Iowa's Forest Action Plan and other native forest & plant communities
3. Maximize forest health by strengthening its resiliency in the face of new pests & diseases
4. Ensure high quality recreational opportunities for hunting, birdwatching, and other outdoor activities
5. Maintain and enhance other societal benefits provided by forests including watershed protection, outdoor recreation, air quality, carbon sequestration, aquatic habitat, diversification of the rural economy and jobs, and more

MANAGEMENT SYSTEMS

The decision on what specific silvicultural activities are prescribed for each stand are based on overall management goals for the WMA and which long-term forest management system is selected: Even-aged, Uneven-aged, Viewshed, or Early Successional. These long-term systems set the big picture framework in place which then helps clarify what short-term activities are recommended.

Even-Aged

Even-aged stands are characterized as having an overstory canopy of trees that are all nearly the same age, even though diameter classes may be different due to stocking levels and individual tree species growth rates.

Even-aged management, when applied at the appropriate scale, can have positive effects on improving habitat for many wildlife species. Larger stands can be divided into smaller stands or blocks to provide for age class diversity when needed. Even-aged management creates stages of excellent habitat for deer, turkeys, and other wildlife species and is essential for the regeneration of oaks, hickories, and black walnuts, which require full sunlight.

Management practices included with even-aged management:

- Periodic overstory thinning to reduce crowded stands to the proper stocking levels. Usually, specific practices

include basal area thinning, crop tree release thinning, and weed tree removal. These practices improve crop tree diameter growth rates, mast production, and improve overall forest health and vigor to help minimize forest insect and disease problems.

- Periodic suppressed canopy tree removal is prescribed to improve forest understory light conditions; usually in pole-sized tree stands to improve understory cover for wildlife. For stands being considered for sawtimber harvesting, suppressed canopy tree removal and weed tree removal are necessary pre-harvest or post-harvest treatments to help make conditions favorable for the establishment of desirable tree species, both natural and planted.
 - Periodic controlled understory burning is prescribed to improve wildlife ground cover and to help control unwanted and invasive tree and plant species in forest understories or along forest edges.
 - Shelterwood and patch clearcutting tree harvest systems, with or without additional tree planting, are recommended as the only suitable harvest systems for regenerating oaks. The Shelterwood system is really a two-cut harvest system that is often used to help develop a population of desirable tree seedlings on the ground before the final overstory removal cut.
 - Savannas and stands composed of coppiced (sprout origin) hardwoods are also types of even-aged management systems.
- There are eight upland stands totaling 84 acres between West and East Salt Creek WMA designated for Even-aged management, to be managed on a 120-year rotation.
- There are another four bottomland stands totaling 45 acres (all at East Salt Creek) which are also designated for Even-aged management on an 80-year rotation.

Uneven-Aged

Uneven-aged management develops a stand of trees with all tree sizes represented. The stand structure is developed by selectively harvesting mature and defective trees, and removing unwanted small trees that are damaged or defective. Because uneven age stands always have large trees present, this system favors species that will grow in shade such as hard maple and basswood. Sustainable harvest guidelines dictate the ability to selectively harvest mature and defective trees every 20 to 25 years in these stands.

Uneven age management will maintain blocks of woodland that will always have larger trees. This system is desirable where the understory is mainly hard maple, on steep slopes, and on areas where always having large trees is important.

Uneven age management areas will provide continuous tracts of woodland with infrequent disturbance. Large tracts of uneven age management will provide necessary habitat for neotropical migratory bird species such as cerulean, hooded, Canada, and Kentucky warblers. Selective harvesting will create small openings in the canopy, which will increase ground cover, and enhance stand structure. Den trees will be left to provide cavities for wildlife such as woodpeckers, bats, and squirrels. Large oaks that are healthy will be left to provide acorns for many wildlife species. Timber stand improvement and selective harvesting will create woody debris on the forest floor for reptiles and amphibians.



- No forest stands at the Salt Creek WMAs are designated for Uneven-aged management systems.

Viewshed

Viewshed areas are typically steep slopes and areas along streams and lakes which can be fragile sites, or sites that enhance the aesthetic recreational quality of the area. Mostly, these sites are best left to naturally progress through succession or only receive light, less invasive management. Areas having observed and documented endangered plant or animal species existing are also candidates for viewshed management.

- Two stands totaling 14 acres are designated for Viewshed management. These are both riparian areas along Wolf Creek at the West Salt WMA.

Early Successional

Species of birds such as American woodcock, golden-winged warbler, blue-winged warbler, black-billed cuckoo, yellow billed cuckoo, and eastern towhee are dependent on the young, dense woody growth. High stem densities of trees and shrubs provide suitable nesting habitat and protection from predators. These stands are usually associated with aspen stands, but in the absence of aspen can be any hardwood stand of mixed or pure species that will be managed for 15-20-year rotations by clearcutting and allowed to re-sprout.

Edge feathering is a type of early successional management along forest / field edges where tree cover is periodically cut (felled) to promote a transition of weedy, brushy cover between forest and field cover. This typically benefits bobwhite quail and sometimes woodcock.

- No stands are scheduled for early successional management

Savanna

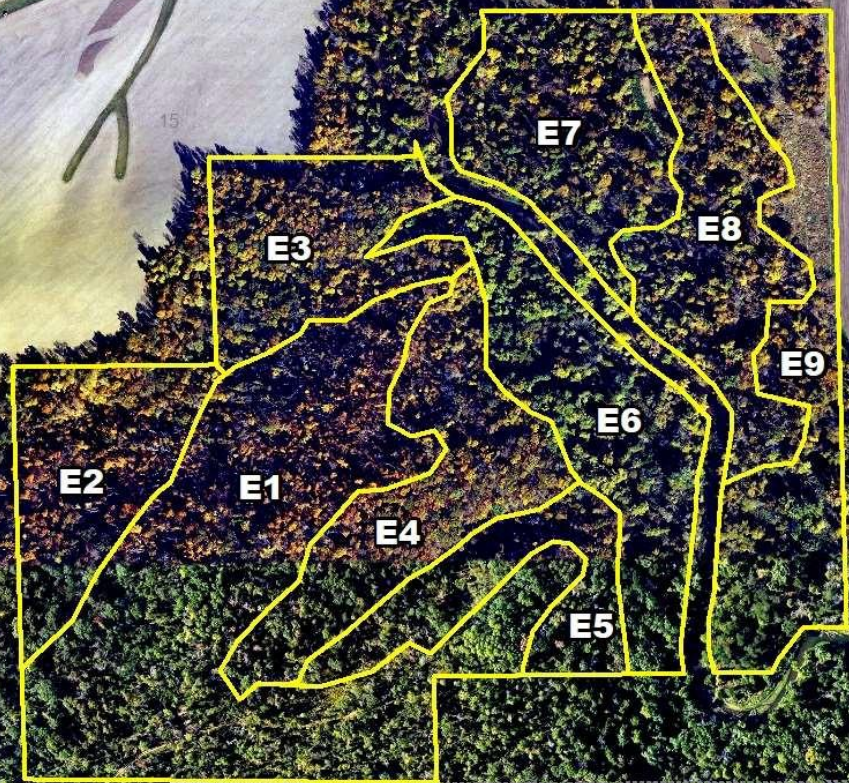
The savanna management system is used to restore or create a forest overstory component that is less than 50% canopy cover, usually oaks or oaks and hickories, and an understory composed of native plants and shrubs. The savanna understory is periodically managed by controlled burning to maintain and improve native understory plant diversity.

- There are currently no stands designated for savanna management, although the large grassland area described above that's currently in grassland/early successional management may be allowed to evolve into savanna in the future.

East Salt Creek WMA - Stands



T83N R13W, Sect. 15
YORK TWP.
TAMA CO.

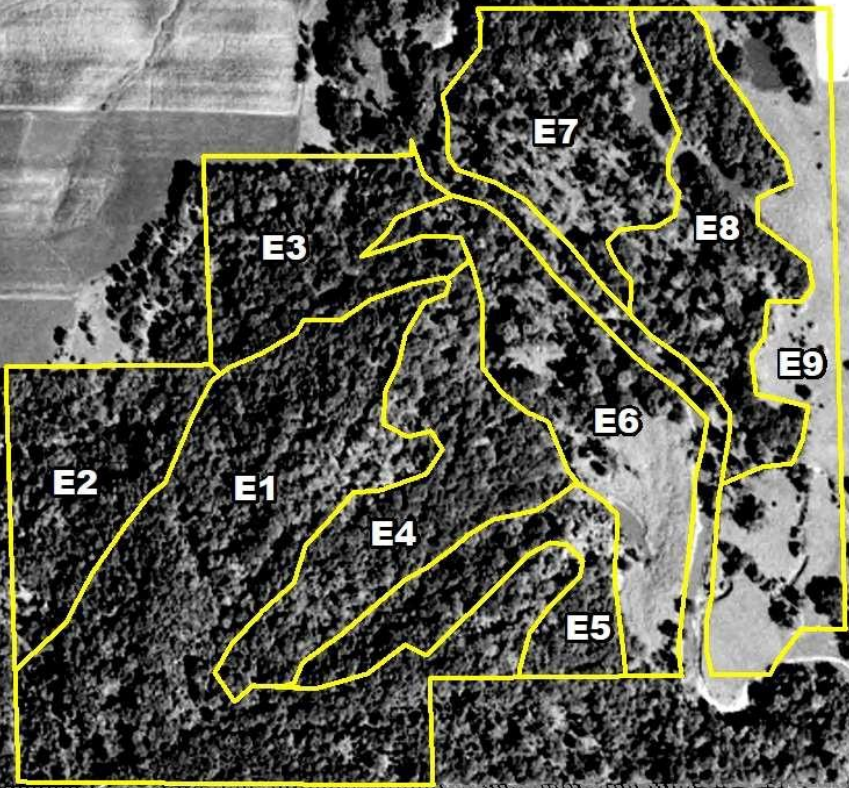


1 inch = 550 feet

USDA NAIP, Iowa State University GIS Facility

East Salt Creek WMA - 1950s

T83N R13W Sect. 15
YORK TWP.
TAMA CO.



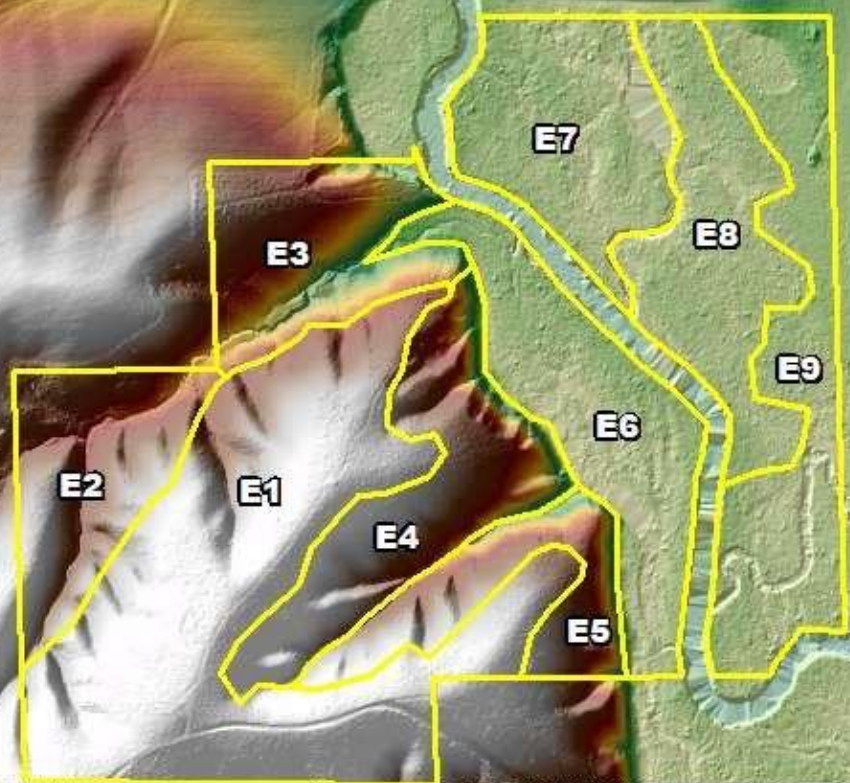
1 inch = 550 feet

Iowa State University GIS Facility, Iowa DNR

East Salt Creek WMA - Stands

42

T83N R13W, Sect. 15
YORK TWP.
TAMA CO.



1 inch = 550 feet

Iowa State University GIS Facility

West Salt Creek WMA - Stands



W14

W13

W12

W15

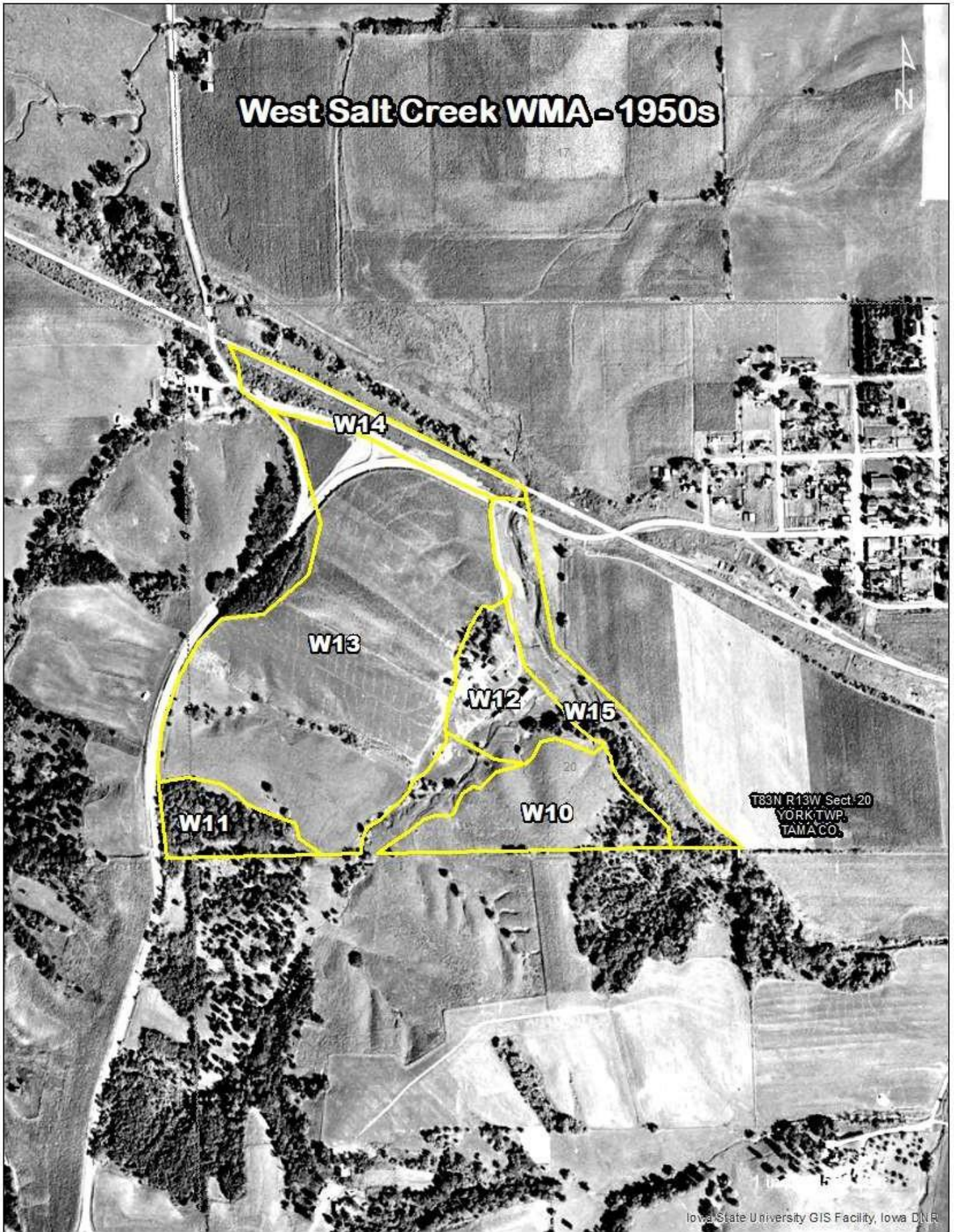
W11

W10

T83N R13W, Sect. 20
YORK TWP.
TAMA CO.

1 inch = 550 feet

USDA NAIAP, Iowa State University GIS Facility



West Salt Creek WMA - 1950s

W14

W13

W12

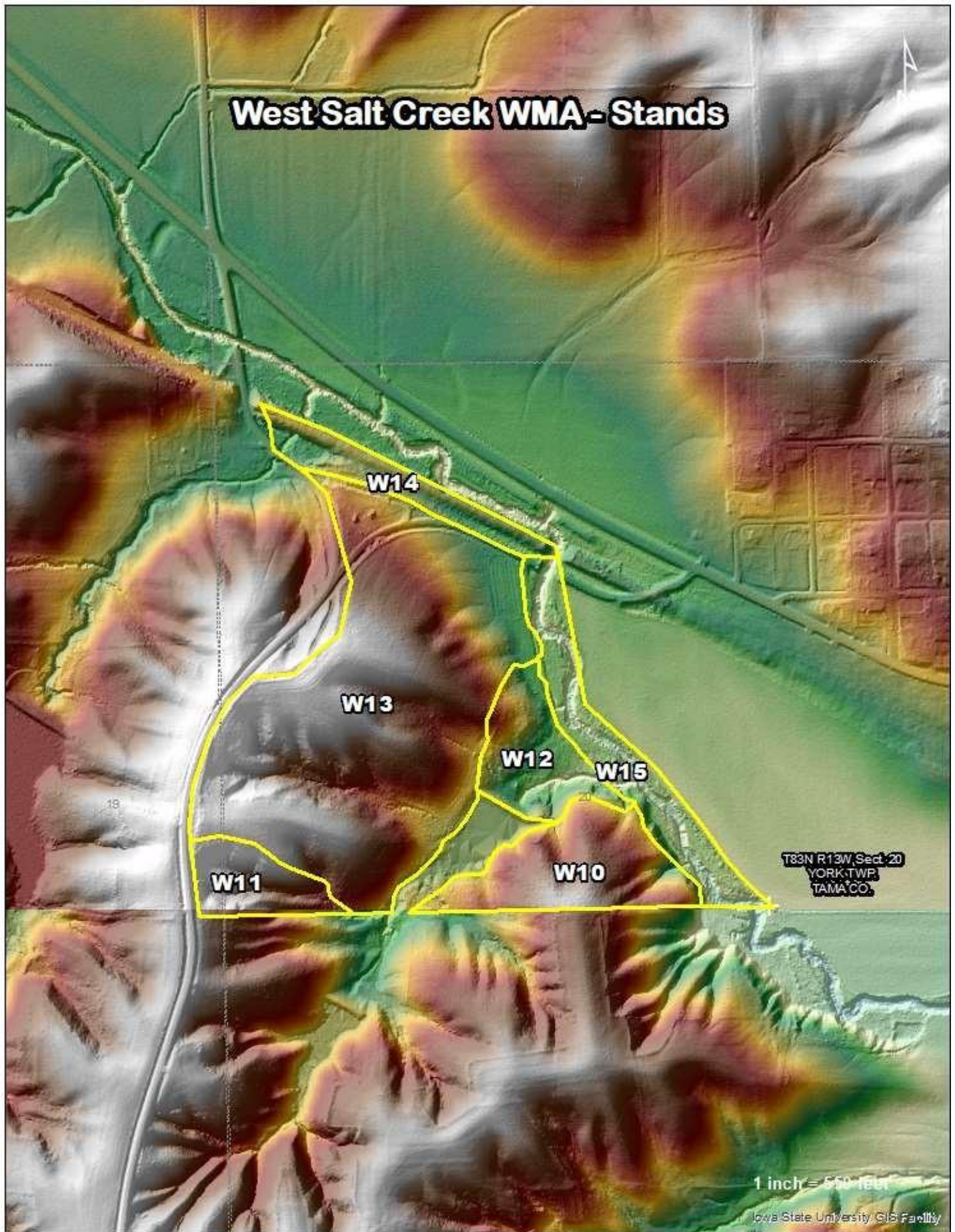
W15

W11

W10

T83N R13W Sect. 20
YORK TWP.
TAMA CO.

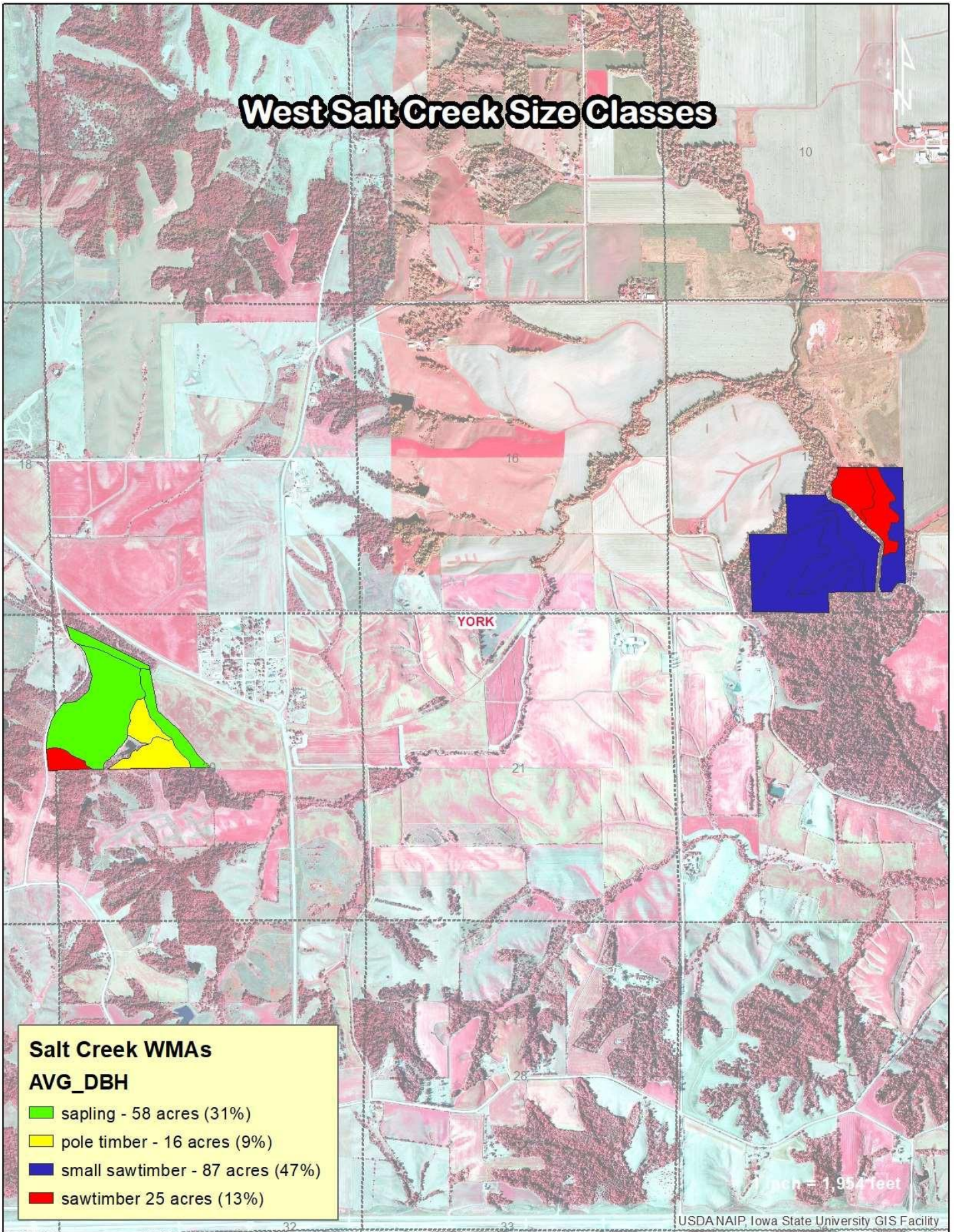
West Salt Creek WMA - Stands



Management Systems



West Salt Creek Size Classes



STAND SUMMARY TABLE

STAND LABEL	AC.	OVERSTORY	AVG_DBH	Prescription	MGMT	REGEN YR	Notes
E1	28.8	Oak-Hickory	Small sawtimber	harvest, weed tree removal	Even Age	2025	Harvest & Regen 2025
E2	8.3	Central Hardwoods	Small sawtimber	weed tree removal	Even Age		
E3	8.6	Central Hardwoods	Small sawtimber	weed tree removal	Even Age		
E4	10.7	Central Hardwoods	Small sawtimber	weed tree removal	Even Age	2040	Next priority for harvest
E5	6.3	Central Hardwoods	Small sawtimber	weed tree removal	Even Age		
E6	11.3	Bottomland Hardwoods, First Bench	Small sawtimber	no action	Even Age	2050	
E7	10.0	Bottomland Hardwoods, First Bench	sawtimber	no action	Even Age	2030	Limited access
E8	10.5	Bottomland Hardwoods, First Bench	sawtimber	no action	Even Age		
E9	12.8	Bottomland Hardwoods, First Bench	Small sawtimber	no action	Even Age		
W10	9.8	Oak-Hickory	pole timber	invasive spp mgmt, seedling planting, crop tree release	Even Age	2027	Caps project
W11	4.4	Oak-Hickory	sawtimber	invasive spp mgmt, harvest, planting	Even Age	2027	Add Caps project
W12	6.5	Central Hardwoods	pole timber	woodland planting, weed tree removal	Even Age	2035	Schedule for 2035
W13	44.3	Exotics (Autumn olive)	sapling	Rx fire, invasive spp mgmt., mowing	Grassland	Manage as grassland	
W14	4.9	Bottomland Hardwoods, First Bench	sapling	no action	Viewshed	n/a	Old road/RR grade
W15	8.9	Bottomland Hardwoods, First Bench	sapling	no action	Viewshed	n/a	Riparian forest

DESCRIPTIONS & RECOMMENDATIONS FOR INDIVIDUAL STANDS

The following section contains narrative descriptions of each of the 15 forest stands with accompanying management recommendations. Stand labels beginning with the letter "E" refer to East Salt Creek WMA, while "W" was used for the West Salt Creek WMA.

East Salt Creek WMA Stands

E1 - Oak ridgetop stand Acres: 28.8

Ridgetop stand that was formerly dominated by an oak-hickory canopy, along with dense pole-sized mixed hardwoods including basswood, bitternut hickory, cherry, elm, hackberry, etc. The stand was hit hard by the 2020 derecho. Some salvage harvest has already occurred, with one final winter season of salvage harvest remaining to be completed from October 2024-March 2025.

In April 2023, 3,000 oak seedlings were planted by a contractor throughout the salvage/derecho area. These seedlings, in addition to abundant natural oak regeneration and a highly diverse forest floor herbaceous community, need sunlight to advance.

Prescription: kill unacceptable tree species, coppice damaged/inferior stems, and complete the salvage harvest of all remaining merchantable trees. Retain 5-7 oak seed trees per acre for wildlife & legacy reserves. Patches or scattered other species can be retained up to a maximum 25% canopy coverage. Note: A tracked skid forestry mulcher may be needed to mow access lanes to complete FSI work.

FSI prescription:

1. Kill all stems between 1" and 12" DBH by hack and squirt method, or other similar means (basal bark, frill or girdle + spray, or cut-surface treatment).
Exceptions:
 - Oaks & shagbark hickory saplings must not be killed
 - Native shrubs, e.g., Serviceberry, viburnum, hazelnut, dogwood, etc. can be retained
2. Kill all trees of any size by hack and squirt or cut-surface treatment:
 - Cottonwood
 - Honey locust
 - Boxelder
 - Mulberry
 - Ironwood
3. Coppice malformed, storm-damaged, suppressed, hard-leaning oak & shagbark hickory trees if less than 12" DBH.

E2, E3, E4, and E5 - Other upland stands Acres: 33.9 total

These stands contain fractured remnants of oak-hickory overstory with an abundance of mixed central hardwoods, including basswood, bitternut hickory, elm, cherry, hackberry, walnut, and others. The understory is dense elm/hackberry/bitternut hickory. Derecho damage was not as severe as in E1 due to the protection of the terrain, but there is still damage.

Prescription: Each of these stands can be scheduled for clearcutting in succession in accordance with the long-term harvest cutting and regeneration cycle (one stand averaging 12.6 acres every 24 years). In the meantime, Forest Stand Improvement may be done to kill unacceptable species and damaged trees to help recruit oak and hickory regeneration in the final 20 years leading up to harvest. Follow the same cutting prescription shown above for Stand E1.

In general, the regeneration procedure will include an assessment of natural regeneration and a harvest & replanting plan. Depending on the circumstances, up to 300 bareroot seedlings per acre will be used to supplement natural regeneration either 1-2 years prior to cutting, or immediately after harvest. A blend of white oak, bur oak, black oak, red oak, shagbark hickory, and black walnut will be planted to supplement natural regeneration. Maintenance activities may

include mowing, herbicide, and release FSI cutting in the first 5 years after harvest.

E6, E7, E8, and E9 - Bottomland stands Acres: 45 total

These are bottomland stands found on the forest floodplain of Salt Creek. The species composition is mainly soft maple, hackberry, boxelder, elm, basswood, bitternut hickory, and walnut. The understory is dense herbaceous plants, elderberry, ragweed, and some hawthorn. There was moderate derecho damage. There are some extensive and deep sand deposits from flooding.

Prescription: Each of these stands can be scheduled for clearcutting in succession in accordance with the long-term harvest cutting and regeneration cycle (one stand averaging 11.1 acres every 20 years). In general, the regeneration procedure will include an assessment of natural regeneration and a harvest & replanting plan. Depending on the circumstances, up to 300 bareroot seedlings per acre will be used to supplement natural regeneration either 1-2 years prior to cutting, or immediately after harvest. A blend of swamp white oak, bur oak, pin oak, shellbark hickory, black walnut, and sycamore will be planted to supplement natural regeneration. Site preparation and scarification to create a mineral soil seed bed prior to spring seed fall will be used to aid in regeneration by native pioneer bottomland species such as silver maple, cottonwood, and willow. Maintenance activities may include mowing, herbicide, and release FSI cutting in the first 5 years after harvest.

West Salt Creek WMA Stands

W10 - SE Oak ridgetop Acres: 9.8

The stand is a 10-acre ridge above Wolf Creek. There's a small patch of old oak timber at the far east end, but the rest was bare pasture up until the late 1970's. After that, the area was abandoned and was colonized by dogwood, autumn olive, honeysuckle, eastern red cedar, cherry, ash, multiflora rose, and others. There are some nice 10-12" mixed oaks, walnut, and hickory on about 40-50% of the stand area, but the rest of the area is low quality in composition and stocking.

Rehabilitate the site by mowing down and killing invasive woody shrubs followed by planting new oaks into unstocked areas. Release the crowns of hard mast crop trees in well-stocked portions.

Prescription: Crop trees will be marked by District Forester to facilitate release where warranted, and to avoid damaging them during site prep activities. Individual trees needing cut/killed will be marked with "X".

In the unstocked portions (western half to 2/3rds), a tracked forestry grinder is needed to mow off the dense dogwood, olive, honeysuckle, and multiflora rose. Aerial and spot-control of invasive shrubs and vegetation will be performed by private contractors in the two seasons prior to planting using a combination of basal bark, cut stump, and foliar applications.

Once the site has been cleared sufficiently to replant, one thousand and five hundred mixed oaks will be planted by hand at a rate of approximately 200 tpa. The species mix will include 60% white oak, 40% mixed red, bur, black, and chinkapin.

After planting, all undesired residual trees will be killed to provide sunlight to the new seedlings. Small trees will be felled to brush in the young oaks, helping deter deer browse. Large trees will be girdled and left as snags. A follow-up weeding of fast-growing woody vegetation will be scheduled for the 3rd growing seasons (as needed) after establishment.

W11 - SW Oak ridgetop Acres: 4.4

Two-aged stand. The older generation is located mostly in the interior and has an overstory of white oak and bur oak up to 24", along with shagbark up to 20". Around the north and east side, and intermixed within the older interior timber, there are healthy 5-14" poles comprised of black oak, bur oak, red oak, black cherry, and shagbark hickory. The midstory has incredibly thick honeysuckle that is too dense to walk through in most areas. Other midstory/understory trees include mulberry, elm, dogwood, hackberry, and multiflora rose. There is heavy damage from the derecho along with severe oak decline.

Prescription:

1. Fecon/brush mow/grind as much of the stand as possible without damaging desirable growing stock trees.
2. Spray stumps and resprouts of honeysuckle, dogwood, multiflora rose using Garlon and carrier
3. Harvest merchantable older timber
4. After the harvest, kill mulberry, elm, hackberry, locust, other common weed trees, along with poorly formed and damaged cherry. Coppice poor quality oak and hickory.
5. Prescribed burning at 3 year intervals may be an option to help set back invasives, woody brush, and non-oak seedlings & saplings for the next 10-20 years. The burning must not harm the current polesized growing stock
6. Cease burning once oak recruitment is evident and manage as a two-aged stand going forward. Alternatively, bareroot seedlings may be planted up to 300 per acre using a mix of white oak, bur oak, black oak, red oak, shagbark hickory, and black walnut after which point no burning should be done.

W12 - Old farmstead Acres: 6.5

Mixed habitat grassy openings, raspberry thickets, walnuts ranging in size from 2-foot tall saplings up to 18" DBH in varying densities, stocking, and quality, scattered oaks 6" in diameter, and a 40" diameter spruce tree. The stand grew up surrounding old farm buildings and disturbed areas. It includes upland and wet/alluvial areas below the pond and along the drainage.

Prescription: Prep for planting by grinding/mowing unstocked portions of shrubby/grassy openings. Work around oaks, good walnut stands, and any desirable trees. Spray with glyphosate to kill vegetation. Plant by hand at 200-300 trees per acre. After planting, kill or coppice all unwanted trees in planting areas. Estimate 900 seedlings needed. Plant white oak, bur oak, red oak, and black oak on upland areas; plant swamp white oak, bur oak, pin oak, and sycamore along drainages/wet areas. Conduct follow-up FSI weeding to fell overtopping fast-growing trees in 3rd year after planting.

W13 - Old fields/grasslands Acres: 44.3

Old fields that have been overtaken by extremely thick dogwood, autumn olive, blackberry, cedar, cherry, elm, ash, and some oaks. Unit staff have been routinely brush clearing and burning the restored prairies. There are a couple food plots within the boundary. The trees have become most established down in the wetter ravines/draws where machine clearing cannot access and fires don't burn as hot - there are decent numbers of polesized oaks established here.

Prescription: Unit staff will continue to manage broadly as grassland habitat using a combination of brush mulching, spraying, and prescribed burning.

W14 - Old RR and highway Acres: 4.9

Mixed habitat with reed canary grass, brome, misc. herbaceous, dogwood patches, cottonwoods, silver maple, elm, cedar, and walnut of varying sizes and densities. A tight barbed-wire fence runs the length between access road and former railroad grade. A ditch separates the two road grades.

Prescription: For now, the site will be designated as viewshed due to poor operability for maintenance activities. If future resources allow, plant the sunny open gaps with a mixture of swamp white oak, bur oak, pin oak, sycamore at 75 trees per acre rate/25-foot spacing. Protect individual oaks with a steel cage and spot-treat weeds and overtopping trees as needed. Let the stand evolve as a mixed species bottomland forest with interspersed oaks. Estimate 150 trees needed.

W15 - Wolf Creek Riparian forest Acres: 8.9

Mixed habitat reed canary grass openings, elderberry thickets, dense walnut sapling regeneration, boxelders in varying densities, stocking that took heavy damage in 2020 derecho. The stand lies along and on both sides of Salt Creek with ditch/banks, wet/alluvial areas which limits accessibility by machines. There is a high amount of deer sign.

Prescription: For now, the site will be designated as viewshed due to poor operability for maintenance activities. If future resources allow, hand plant swamp white oaks, pin oaks, bur oaks, and sycamores at 50 trees/acre or 30 foot spacing in

sunny areas. Protect individual oaks with a steel cage and spot-treat weeds and overtopping trees as needed. Let the stand evolve as a mixed species bottomland forest with interspersed oaks. Estimate 150 trees needed.

PROPOSED PROJECT COMPLETION SCHEDULE

Year	Stand(s)	Description
2025	E1	Complete harvest and post-harvest FSI (weed tree removal) to regenerate
2027	W10	Caps project(s) to clear invasives, spray, site prep, tree planting, & maintenance; maintenance years 2027-2030
2027	W10	Caps project to do Crop tree release on eastern half of stand
2027	W11	Caps project to clear invasives and spray; maintenance years 2027-2029
2028	W11	Harvest merchantable timber, post-harvest FSI, and begin Rx burning
2030	E1	Year 5 release FSI
2030	E7	Initiate harvest & regen caps project; schedule maintenance
2031	W11	Caps project to underplant stand contingent on natural regen
2032	E4	Caps project for pre-harvest FSI (WTR - shelterwood)
2035	W12	Initiate caps restoration project to site prep, plant, and WTR; schedule maintenance
2036	W11	Year 5 release of planted seedlings
2040	E4	Harvest and regenerate stand E4
2050	E6	Harvest and regenerate stand E6

See long-term schedules below

Long-term harvest/regeneration cycles:

Stands	Acres/Rotation	Cycle
E1-E5	63 ac rotated every 120 yrs	Average 12.6 acres (1 stand) every 25 years
E6-E9	45 ac rotated every 80 yrs	Average 11.1 acres (1 stand) every 20 years
W10-W12	21 acres rotated every 120 yrs	Average 6.9 acres (1 stand) every 40 years; note Stands W10 and W11 are two-aged stands and will alternate cohorts at 60 yr intervals within each stand

The harvest and regeneration schedules set forth in this plan serve as a general planning tool. They do not preclude the option to conduct salvage harvests in the case of catastrophic storm damage, pests, or natural mortality when necessary.

GENERAL MANAGEMENT CONSIDERATIONS

Hazard Tree Management

Hazard trees carry a risk of structural failure coupled with the potential to cause property damage or personal injury. To be considered hazardous, a tree must have the following: 1) major structural defect(s) that make it more prone to failure and 2) a nearby target that it could land on such as a building, picnic table, parked car, campsite, bench, etc. Hazard tree management, especially in and adjacent to “high use” areas should be conducted continuously in accordance with DNR policy to lessen or eliminate potential danger to WMA users. In general, trees will not be girdled for management reasons if there is potential to fall onto a road, parking lot, or other feature that draws frequent & prolonged use.

Rare, Threatened, and Endangered Species

While habitat management activities are intended to have an overall conservation benefit through habitat improvement, at times these activities may have unintended consequences for a variety of species. For this reason, prior to implementation, forest management activities described here will be reviewed internally to assess potential impacts to both state and federal species of concern. When protected species are known to occur in the management area or if

suitable habitat for these species is present, management biologists implement conservation measures as described in the Operation & Maintenance Plan for Wildlife Management Areas in the State along with recommendations from DNR staff. Management activities are not initiated until this review has been completed and T/E comments/concerns have been addressed.

Best Management Practices for Soil, Wetland, and Water Quality Protection

Protection of soil and water resources is of utmost importance. Forest management and timber harvesting activities have the potential to negatively impact these qualities, but with careful timing and best management practices these impacts can be made negligible:

- Timber harvests and any work involving heavy equipment will only be done during times when the ground is frozen, firm, or dry. This prevents compaction of the soil and also protects the fragile herbaceous plants of the forest floor
- No logging slash or debris is to be left in streams or flow pathways
- Pesticides used for invasive species control are to be applied in the appropriate dosage and at the proper time, according to product label
- Access trails and forest roads shall be carefully situated on stable slopes with erosion control measures such as waterbars installed
- Protect sensitive areas like stream banks & lake shores (riparian areas) by leaving forested buffer strips from 50 to 150 feet wide (depending on stream width and topography) next to streams. Management in these areas should be limited to woodland understory and midstory tree manipulation and selective overstory harvesting. Always try to maintain a minimum of 70% overstory canopy cover in riparian areas
- If bare soil areas are created or existing trails are not properly constructed, use soil stabilization practices to minimize the existing erosion hazard. These may include mulching, seeding, and building sediment control structures

All other considerations and best practices for protecting water & soil resources are discussed in Iowa's Forestry Best Management Practices manual, available online at www.iowaDNR.gov.

Aesthetics & Recreation

The woodlands of Salt Creek WMA are popular for outdoor recreation and enjoyment. Forest management activities can negatively impact these qualities in the short term. Trees and tops left after thinning and harvest operations are seen by some as unsightly "brush" and prescribed burning leaves the ground bare and black scorch marks and char on the trees and downed wood. Some of this must be dealt with by educating WMA users on what they are seeing and why it is being done for long-term ecological benefits. Beyond that, the following measures are meant to help minimize the impact of forest management to the aesthetic beauty and recreation capacity of Salt Creek WMA:

- Limit the frequency of clearcutting and other forest management activities through rotational even-aged management at 20-year or greater intervals
- Either remove, pile, or break down slash from thinning/invasive plants control operations to fall flush to the ground and decompose. Do not leave hazardous snags within striking distance of infrastructure.
- Require stumps from thinning operations be left no higher than 6" above the top of the root flare

Forest Health & Integrated Pest Management

Forest ecosystem health is best maintained by using management practices that promote maximum diversity of native species, environments, and habitats throughout the area. This will help buffer major, catastrophic losses to pests such as spongy (formerly gypsy) moth, emerald ash borer (EAB), oak wilt, and others. Patch regeneration tree plantings and natural regeneration are extremely important to diversifying the age structure of the forest population and prevent catastrophic storm damage.

Limiting all or most management work to the dormant season helps minimize soil disturbance and injury to non-target plants & trees, and reduces the incidence of invasive pests, insects, and diseases. For instance, to prevent and inhibit the spread of oak wilt, most tree cutting activities are to be done between November and March.

Incidental tree damage by harvesting and thinning activities is to be minimized by timing these activities to occur during the dormant season and through the requirement of careful selective felling practices. Machinery must be kept to skid trails and roads to minimize physical injury to the other trees.

The use of pesticides will be minimized by using silvicultural practices that promote native species when possible (e.g., prescribed burning), and using selective cut-stump application methods at the appropriate timing and rates, according to label instructions.

Important Cultural, Archeological, or Ecological Sites

Every effort will be made to identify and protect natural resource and man-made “special sites” before and during forest management work. Sites that are historical and cultural resources include such things as buildings and structures of historical significance, human burial sites, special land features, and artifacts. If such things are ever observed or discovered, those sites will be located, preserved, and avoided when implementing forest management activities. Human remains that are discovered or accidentally uncovered must be reported to local law enforcement officials. This reporting is required by Iowa Code 558.69. Discovered artifacts or structures of suspected historical significance will be reported to the State Archaeologist and the discovery will be protected. No excavation of stumps or earthwork is being proposed by this plan. The following are practices that will help minimize the chances of accidentally destroying items of cultural or historical significance when doing forest management work:

- Thoroughly inspect a project area before working. Look for unusual looking areas such as obvious mounds or groups of mounds, or square and rectangular shaped depressions or extrusions.
- Minimize ground disturbance when tree planting, logging, and doing forest stand improvement work. Cut trees and use heavy equipment only when the ground is frozen, dry, or firm.
- Be especially careful of disturbing soil around streams, lakes, and riparian (stream bank) areas.
- Locate management access roads along natural land contours.

Monitoring

Monitoring the long-term results of forest management decisions, including the decision to do nothing in a specific stand or area, is important in order to document successes and failures and ensure that the desired effects are being had on native flora and fauna. Ideally, monitoring should be an interdisciplinary effort that includes foresters, wildlife biologists, botanists, and ecologists, and it should be founded on science-based methodology and should be ongoing to capture long-term effects. Historically, limited staff and funding have constrained the amount of monitoring that can be done. Thus, every effort will be made by DNR staff to collaborate internally to measure and assess the effects of forest management subject to resource availability.

Public Forestry Field Days

Workshops that showcase and demonstrate land stewardship and conservation to the public in ways that are easy to understand and apply are a very effective way to reach out to adjacent landowners. As improvement projects get underway, wildlife and forestry staff from both public and private land backgrounds should coordinate and hold tours of project sites and invite expert guest speakers for public education and promotion of good conservation practices.

SPECIES OF GREATEST CONSERVATION NEED

The Iowa DNR's *Iowa Wildlife Action Plan (IWAP)* identifies certain wildlife species as species of "greatest conservation needs". Management activities must always take into consideration these Species of Greatest Conservation Need, and also to "keep common species common."

Common Name	Scientific Name	Habitat Preference
Amphibians and Reptiles		
Tiger Salamander	<i>Ambystoma tigrinum</i>	Generalist
Prairie Kingsnake	<i>Lampropeltis calligaster</i>	Open grassland and woodland edge
Bull Snake ^{SC}	<i>Pituophis catenifer sayi</i>	Tallgrass prairie and savannah
Smooth Earth Snake	<i>Virginia valeriae</i>	Moist wooded areas and stream valleys
Northern Prairie Skink	<i>Plestiodon septentrionalis</i>	Open grassland with loose/gravelly soils and rocky areas - tends to choose habitat adjacent to wetlands
Smooth Green Snake ^{SC}	<i>Opheodrys vernalis</i>	Moist grassy areas/prairies or grassland surrounding lakes/impoundments
Smallmouth Salamander	<i>Ambystoma texanum</i>	Woodland pools and open woods
Western Wormsnake ^T	<i>Carphophis amoenus</i>	Rocky woodland
Butterflies		
Zabulon Skipper	<i>Poanes zabulon</i>	Riparian zones, old-field, woodland edge
Reikert's Blue	<i>Echinargus (Hemiargus) isola</i>	Native prairie
Byssus Skipper ^T	<i>Problema byssus</i>	Tallgrass prairie
Odonates		
Slaty Skimmer	<i>Libellula incesta</i>	Backwater
Sulphur-tipped Clubtail	<i>Gomphus militaris</i>	Lake/pond
Spangled Skimmer	<i>Libellula cyanea</i>	Lake/pond
Vesper Bluet	<i>Enallagma vesperum</i>	Lake/pond
Mammals		
Elliot's Short-tailed Shrew	<i>Blarina hylophaga</i>	Forest, woodland, savanna, grassland
Northern Myotis ^{*FE}	<i>Myotis septentrionalis</i>	Forest
Bobcat	<i>Lynx rufus</i>	Forest, woodland, grassland
Spotted Skunk ^E	<i>Spilogale putorius</i>	Grassland, savanna, forest, and farmsteads
Woodland Vole	<i>Microtus pinetorum</i>	Forest
Gray Fox	<i>Urocyon cinereoargenteus</i>	Forest/woodland
Franklin's Ground Squirrel	<i>Spermophilus franklinii</i>	Tallgrass prairie, savanna, roadsides
Prairie Vole	<i>Microtus pinetorum</i>	Upland prairie
Plains Pocket Gopher	<i>Geomys bursarius</i>	Warm season herbaceous grassland, herbaceous wetland, savanna, roadsides
Indiana Bat ^{FE}	<i>Myotis sodalis</i>	Forest
Tricolored Bat ^{*PFE}	<i>Perimyotis subflavus</i>	Forest
Grassland-shrub nesting birds		
Northern Bobwhite	<i>Colinus virginianus</i>	
Loggerhead Shrike	<i>Lanius ludovicianus</i>	
Bell's Vireo	<i>Vireo bellii</i>	
Field Sparrow	<i>Spizella pusilla</i>	
Common Name	Scientific Name	Habitat Preference

Common Name	Scientific Name	Habitat Preference
Brown Thrasher	<i>Toxostoma rufum</i>	
Woodland-Shrub nesting birds		
American Woodcock	<i>Scolopax minor</i>	
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	
White-eyed Vireo	<i>Caprimulgus vociferus</i>	
Yellow-breasted Chat	<i>Icteria virens</i>	
Common Yellowthroat	<i>Geothlypis formosus</i>	
Forest Nesting Birds		
Red-shouldered hawk ^E	<i>Buteo lineatus</i>	
Ruffed Grouse	<i>Bonasa umbellus</i>	
Broad-winged hawk	<i>Buteo platypterus</i>	
Eastern Whip-poor-will	<i>Caprimulgus vociferus</i>	
Chimney Swift	<i>Chaetura pelagica</i>	
Acadian Flycatcher	<i>Empidonax virescens</i>	
Wood Thrush	<i>Hylocichla mustelina</i>	
Louisiana Waterthrush	<i>Parkesia motacilla</i>	
Kentucky Warbler	<i>Geothlypis formosus</i>	
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	
Eastern Screech Owl	<i>Otus asio</i>	
Northern Flicker	<i>Colaptes auratus</i>	
Eastern Wood-Pewee	<i>Contopus virens</i>	
Eastern Kingbird	<i>Tyrannus tyrannus</i>	

State-listed species (Code of Iowa, Chapter 481B): Special Concern (SC), Threatened (T), and Endangered (E)
 Federally-listed species (Endangered Species Act of 1973 (ESA; 16 U.S.C. § 1531 et seq.): Candidate (FC), Threatened (FT), Endangered (FE); P indicates the species has been proposed for listing under the ESA.