

CHAPTER 2 - DESCRIPTION OF ALTERNATIVES

I. INTRODUCTION

The purpose of this chapter is to present the alternative formulation process and then describe four "Action" and one "No Action" alternatives with respect to the proposed new Refuge.

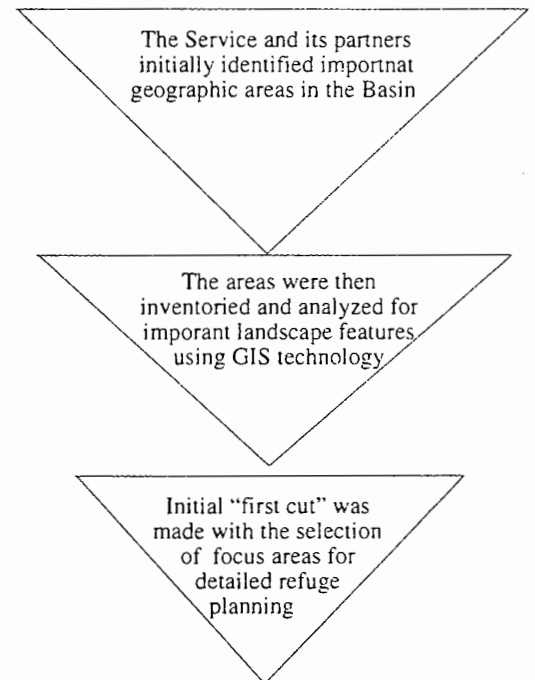
II. FORMULATION OF ALTERNATIVES

The Service formulated alternatives for the proposed Refuge in conjunction with its partners in both Illinois and Indiana. The No Action alternative reflects the current state of conservation activity (status quo) within the Basin. The Action alternatives would provide the opportunity for a coordinated effort among the citizens of the Basin and agencies and organizations working in the Basin to restore and preserve migratory birds, fisheries, and biological diversity.

The process of developing the Action alternatives involved input from partner organizations and the use of Geographic Information System (GIS) technology provided in part through the Indiana Gap Analysis project, the Illinois Natural History Survey, and the Illinois and Indiana Departments of Natural Resources. These data were used to identify a set of "focus areas" (Figure 8) which constitute subsets of the Basin from St. Joseph County, Indiana, to Iroquois County, Illinois.

It is important to understand that focus areas do not correspond directly to specific areas identified by the Service for acquisition. Rather, focus areas are the initial "first cut" in a process aimed at narrowing down potential Refuge areas within the Basin, ie. ie. ⇔ Kankakee River Basin ⇔ focus area ⇔ individual refuge units. Focus areas typically involve greater than 30,000 acres in each of the Action alternatives. This is because focus areas represent refuge design at its broadest conceptualization. Identifying focus areas larger than the 30,000 acres gives the Service flexibility to address both ecological and social concerns in developing the Refuge, and helps to delineate a landscape where Service partners could work cooperatively to manage lands for the benefit of natural resources. The Service will continue to refine the site selection process based on biological and non-biological criteria as well as public input in order to identify potential sites for a new refuge.

Land acquisition would be under the authority of the Fish and Wildlife Act of 1956 and the Emergency Wetlands Resources Act of 1986 and would occur over approximately 20-40 years. Land acquisition would be by donation, exchange, trade for other Federal lands, conservation easements, and fee-title purchase from willing sellers.



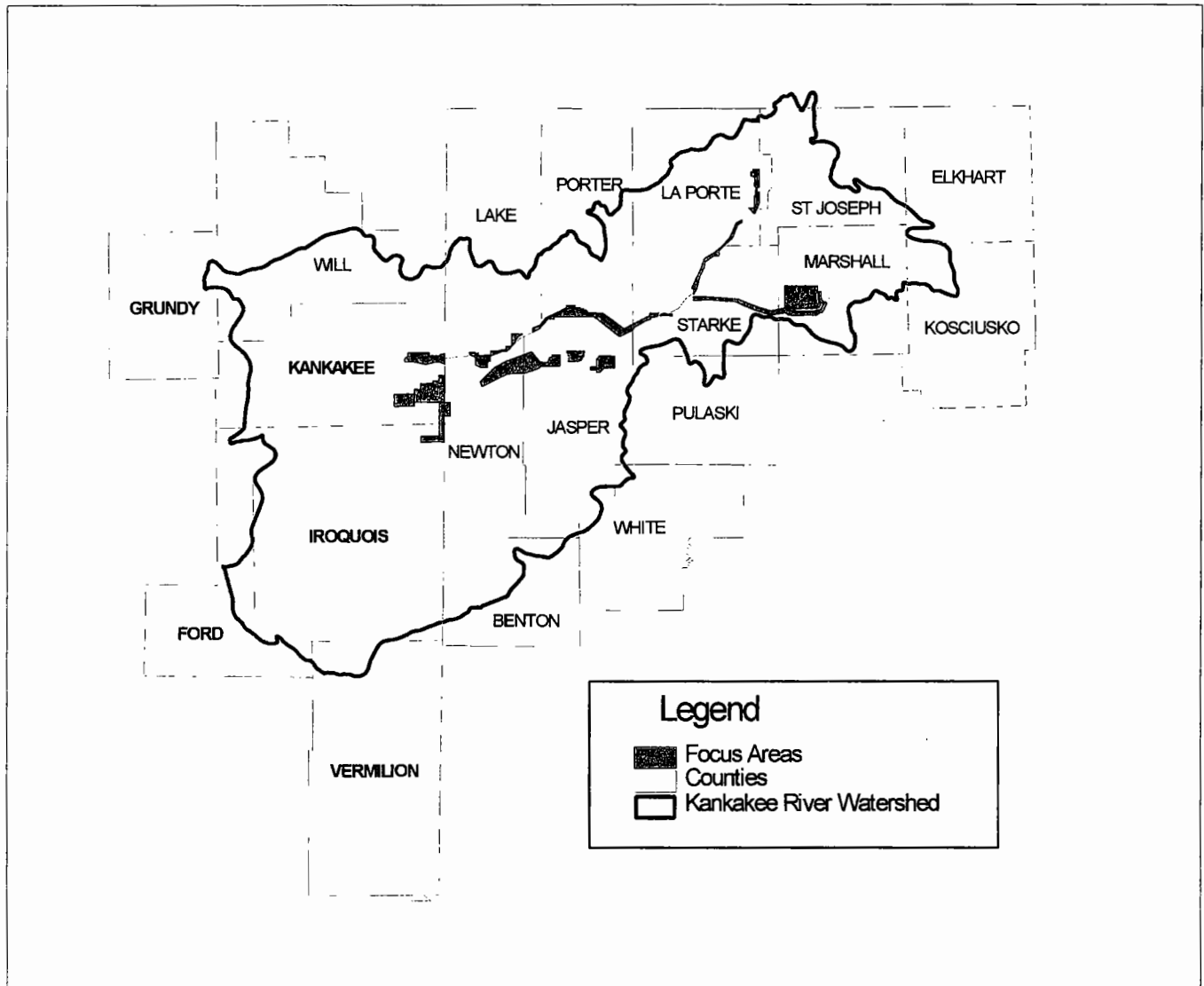


Figure 8 - Focus Areas for the four Action alternatives (alternatives 2-5). Note: focus areas are not Refuge boundaries. Refuge boundaries would conform to individual land tracts as they are purchased from willing sellers within the focus areas.

Management of the proposed Refuge would be consistent with Service policies concerning its National Wildlife Refuges and the aforementioned goals. The Action alternatives embrace the goals of protecting and restoring habitat in order to prevent additional species in the Basin from becoming listed under the Endangered Species Act; providing additional opportunities for wildlife-dependent recreation; improving water quality in the Basin; providing opportunities for environmental education; and where feasible, alleviating local flooding problems within the Basin. Common to all Action alternatives is the development of a Comprehensive Conservation Plan which will provide long-range guidance and management direction for the Refuge to accomplish its purpose, contribute to the mission of the National Wildlife Refuge System, and to meet other relevant mandates.

1. Identification of Focus Areas

1. Identification of Focus Areas

In order to begin the process of identifying the most important areas for the conservation of Service trust resources in the Basin, the Service formulated focus areas using an Expert Workshop approach (Johns and Soule 1995) and the best available data using GIS-aided reserve design methodology. For each Action alternative, the Service identified focus areas through the analysis of land cover, threatened, endangered and other species distribution, hydrography, wetlands, anthropogenic landscape features, and other data acquired through the Illinois DNR, Indiana DNR, The Nature Conservancy, Service, and Illinois Natural History Survey through the Gap Analysis projects in Indiana and Illinois, respectively.

The land use classes used in the focus area analysis were developed from comparatively coarse satellite data and have not been subjected to formal accuracy assessment. The reader is cautioned not to use the maps included in this report to evaluate individual parcels. The Service will not rely on these data for site-specific planning.

The process for identifying focus areas included:

1. Service meetings with partner agencies in late 1996 and 1997. In these meetings, the partner organizations broadly-defined geographic areas that met their ecological criteria for importance.
2. These geographic areas were transferred to United States Geological Survey (USGS) 7.5 minute topographic maps and then on-screen digitized into the GIS using USGS Digital Raster Graphics (DRG's) of the same 7.5 minute topographic sheets.
3. Important GIS data layers for analyses were collected for designing the proposed Refuge including: a "cross-walk" of land cover maps from the Indiana Gap Analysis project and the Illinois Natural History Survey (mostly 1992 Thematic Mapper (TM) satellite images); National Wetland Inventory (NWI) maps for the watershed; data from the Illinois and Indiana Heritage Programs (endangered, threatened, and rare communities and species); Managed Areas from the Indiana Gap Analysis project; transportation from USGS 1:100,000 Digital Line Graphs (DLG's); hydrography (rivers and streams) also from USGS 1:100,000 DLG's; and Meyer's map of the historic Grand Marsh.
4. Visual analysis of the data was conducted with respect to:

A. *The Kankakee River Corridor*

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|--------|---|
| STEP 1 | Evaluate an appropriate corridor based on the occurrence of historic forested wetland according to Meyer and on the expanse of existing forested wetlands based on NWI. |
| STEP 2 | Visually select and on-screen digitize lines along the Kankakee River mainstem emphasizing important habitat blocks and continuity of the riparian corridor. |

B. Concentrations of Primary Ecosystems

- STEP 1 Visually inspect the land cover data, NWI, and DRG's for concentrations of wetlands, grasslands, and probable savanna.
- STEP 2 On-screen digitize areas around concentrations including adjacent potential restoration or management lands.

C. Corridors Among Managed Areas

- STEP 1 Visually inspect potential corridors of natural vegetation among managed areas focusing on riparian corridors, blocks of habitat, and linear habitat features.
- STEP 2 Evaluate opportunities to enlarge existing areas with similar ecosystem types, and buffer (safeguard) where appropriate.
- STEP 3 On-screen digitize large blocks or continuities of habitat among managed areas emphasizing largest and most complete corridors and considering existing connectivity among managed areas.

D. Distribution of Threatened (T) and Endangered (E) Species

- STEP 1 Visually evaluate distribution of T and E species and rare communities in relation to managed areas and partner priority areas.
- STEP 2 Evaluate existing habitats for T and E species to see if there are gaps in existing managed areas or priority areas.
- STEP 3 On-screen digitize important areas based on the location, type, and number of Heritage Data points.

E. Anthropogenic Features

- STEP 1 Visually evaluate the location of roads, cities, and other developed features in relation to existing managed areas and priority areas.
- STEP 2 Eliminate some areas from consideration based on proximity to developed areas, lack of feasibility for restoration because of developed features, or lack of connectivity based on developed features.

Additional analysis and refinement of focus areas will be completed during the CCP process. The CCP process will include a detailed evaluation of the focus areas, although sites outside the focus areas could be evaluated should they meet the criteria for achieving Refuge goals, and should willing sellers exist. Features critical to Service goals, such as the occurrence of wetlands, grassland, oak savanna, and threatened and endangered species will form the basis of the site selection process. GIS-based algorithms will generate a list of parcels that best achieve Refuge goals and objectives (Pressey, Johnson, and Wilson 1994). This site-selection process has the flexibility to provide both alternative sites and to project a new suite of sites as lands are acquired. The presence of willing sellers will ultimately determine any acquisition for the proposed new Refuge.

It should be noted that development of this Refuge is controlled by a number of factors. They include: land availability, land ownership, topography, climate, water availability, water quality and temperature, water rights, potential for competitive water use, soil - chemistry, permeability, compaction, texture, natural resource value - endangered, threatened, candidate species; special habitats, adjacent land use, proximity to supporting infrastructure, access - roads, bridges, etc., potential and severity of major climatic disturbances, local political, social and economic factors, regulations, environmental constraints, security, upland use, and pollution, to name a few.

III. ALTERNATIVE CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Many suggestions and comments were received during the public scoping process and a wide range of management options were identified. For example, numerous individuals stated that the Service should restore and preserve the former "grand marsh." Others argued that intensifying management of existing managed areas or expanding the Service's Partners for Fish and Wildlife program would meet Service objectives for the area. While each of these management options have merit, we did not recommend them for additional evaluation for the following reasons.

Restoration and preservation of the former 500,000 acre grand marsh was eliminated from consideration after careful review of land uses such as crop land and home sites, costs associated with restoring the land, and input received during meetings with the public, local officials, and landowners.

Intensifying management on existing managed areas was not recommended for further evaluation because managed lands within the Basin are already undergoing intensive management to maintain productive habitat for wildlife. Although more intensive management could perhaps increase the amount and diversity of wildlife on existing managed lands, this alternative would not result in a net gain of habitat preserved and managed, substantially improve waters entering the Kankakee River, or contribute to the long-term recovery of many Service trust resources. Therefore, due to its limited potential, this alternative was removed from further consideration.

Energetic promotion of the Service's Partners for Fish and Wildlife program may indeed generate wetland restoration projects on private lands within the Basin, which is a primary objective of this project. However, no restoration of a functioning riparian ecosystem complex, including bottomland hardwood forests and associated uplands, could be obtained or secured for present and future generations. Parcels of land that would be enrolled in private lands agreements would largely be disjointed and small, limited to where historical wetland basins occurred, and limited by a 10 year agreement. Limited protection of existing natural resources within the Basin would be afforded. There would be no active management or plan for management of Service trust species or other natural areas in the Basin. Any potential for these lands to contribute to education, research, water-based and/or wildlife-dependent recreation would be limited to the private landowner of the properties enrolled in the agreement. The Basin's water quality would not be substantially improved by this piecemeal approach. Therefore due to its limited potential, this alternative was eliminated from further consideration also.

IV. DESCRIPTION OF ALTERNATIVES

Alternative 1 "No Action"

Under the No Action alternative, the Service would not develop a new National Wildlife Refuge in the Basin. The No Action alternative would continue the conservation status quo. The No Action alternative would not result in the complete cessation of habitat conservation and restoration in the Basin. The No Action alternative, however, would result in less coordination among the various conservation organizations. This inefficiency could have at least two possible consequences. The first is less effective conservation of biodiversity. The second is the need to manage a larger percentage of land in the watershed to achieve biodiversity conservation goals. In the meantime, opportunities to work at the landscape scale in the Kankakee watershed rapidly disappear. Most of the threats to the watershed have been realized over the past 150 years. However, a substantial amount of oak savanna was lost in the last 20 years when several thousand acres in the Indiana portion of the watershed were cleared for a now defunct ranching operation. The southeastern Kankakee County/northeastern Iroquois County area in Illinois is similarly vulnerable.

Alternative 2 - Wetlands

The wetlands alternative focuses on the protection and restoration of important wetland areas along the mainstem of the Kankakee River and its tributaries. Figure 9 indicates that both protection of existing resources and restoration would occur primarily within the riparian zone of the Kankakee and Yellow Rivers. This Action alternative would function to protect and restore forested, shrub-scrub, and emergent wetlands for the migratory bird and associated species that depend on them.

Alternative 2 would potentially link the Momence Wetlands Conservation Area in Illinois with LaSalle Fish and Wildlife Area, Grand Kankakee Marsh County Park, NIPSCO Savanna Wetlands, Kankakee Fish and Wildlife Area, and Kingsbury Fish and Wildlife Area in Indiana. It would also establish a corridor from the Menominee Wetland Conservation Area in Marshall County along the Yellow River to Kankakee Fish and Wildlife Area on the Kankakee River.

The reason for the wetland scenario in the Basin is clear: the Grand Kankakee Marsh was among the most important wetland ecosystems in the continental United States. It was important for numerous species of plants and animals including waterfowl and other wetland-dependent birds, herpetofauna, hydrophytic plants, and other biota. In addition, wetland functions such as flood water storage, ground water recharge, and water quality improvement have significant value to society.

The Grand Marsh, however, has been almost completely drained and the resulting hydrology will present numerous restoration challenges. Important considerations with respect to implementing alternative 2 include: restoring hydrology on refuge lands without affecting neighboring landowners; restoring wetlands that functionally and biologically represent pre-drained wetland types; restoring sufficient area (considering the Grand Marsh covered up to 1 million acres and the proposed Refuge would only total 30,000 acres) to return a functioning landscape; and restoring wetlands that provide multiple values important to refuge clients.

TABLE 2.1
Existing Land Use by Focus Area (in acres) in the Wetland Alternative

FOCUS AREA #	TOTAL	WETLAND	GRASSLANDS/ PASTURE	UPLAND FOREST	AGRICULTURE	URBAN
2	1434	497	41	186	710	0
3	3829	289	92	64	3376	8
4	988	40	10	30	889	19
5	431	108	20	22	281	0
6	2027	727	172	230	867	31
8	5807	2172	897	708	1995	35
11	1695	483	152	232	822	6
16	11856	969	387	2937	7498	65
18	4121	939	127	640	2401	14
19	7129	1491	291	609	4724	14
20	1420	379	20	191	830	0
21	9893	1967	180	1009	6726	11
22	421	175	16	61	169	0
TOTAL	50,382	10,236	1,736	6,919	31,288	203

Alternative 3 - Grassland

The grassland scenario focuses on the protection and restoration of important areas of grassland and oak savanna. Under this scenario, the Service would protect, restore, and enhance existing oak savanna and prairie habitat, degraded habitat, and likely work cooperatively with private landowners to manage some non-native grassland habitat. Figure 10 indicates the location of the focus areas for this alternative occur about equally in Illinois and Indiana. Leach and Ross, 1995, suggest an appropriate target for protection of oak savanna may be 2% to 3% of the land in each physiognomic province. The area of both the Central Till Plains Section (15,326,281 acres) and the smaller Grand Prairie Subsection (4,797,090 acres) were established using GIS and the digital U.S. Forest Service map of Ecological Units of the Eastern United States (Keys, et al. 1995). It is not entirely clear which of these corresponds with the physiognomic province suggested by Leach and Ross. However, if we use the smaller Grand Prairie Subsection, and generously estimate the amount of oak savanna potentially protected by the Refuge at about one-third of the 30,000 acre refuge total, only about 0.2% as a percentage of the Subsection is protected.

Alternative 3 has two main purposes: The first is to establish large blocks of contiguous grassland working with partner conservation organizations and private landowners. The second is to protect the last important remnants of the oak-savanna ecosystems. Protecting large blocks of savanna and grasslands with a focus on migratory grassland birds, which are declining faster even than forest interior species, and rare ecosystem conservation are the reasons for the grassland scenario.

TABLE 2.2
Existing Land Use by Focus Area (in acres) in the Grassland Alternative

FOCUS AREA #	TOTAL	WETLAND	GRASSLANDS/PASTURE	UPLAND FOREST	AGRICULTURE	URBAN
7	2504	15	228	708	1550	3
9	16545	65	2393	4206	9540	341
10	4368	52	495	1092	2724	5
13	10053	56	4903	1412	3572	110
14	4353	43	2300	244	1703	63
15	6736	71	2172	217	4137	139
TOTAL	44,559	302	12,491	7,879	23,226	661

The Kankakee River Basin and its adjacent landscape are part of the Grand Prairie Natural Region that crosses northern Illinois and juts into northwestern Indiana. The prairies and savannas associated with this region are significant ecosystems in terms of their rarity, flora, and dependent fauna. The proposed Refuge could contribute significantly to the conservation of area-sensitive migratory grassland birds with its focus on protecting or restoring large habitat blocks. We also have the opportunity to conserve other grassland fauna and rare plant species associated with savannas and prairies. Although the traditional nature preserve approach of acquiring small, high quality areas may be more efficient and effective for plant conservation, the proposed Refuge could contribute to the stability of nature preserves by buffering them and providing connectivity.

Challenges in implementing alternative 3 include: the rarity of existing undeveloped savanna; the expansion of urban sprawl into these areas and the related costs of acquiring them; the acquisition and restoration cost for grasslands; the long-range management implications of replacing the natural disturbance of fire in the ecosystem; and, technical issues in restoring native grassland. A technical problem associated with grassland restoration in light of the scarcity of existing prairie, is acquiring sufficient prairie seeds. Efforts are underway to address this problem. In 1993, the IDNR in cooperation with the Service and The Nature Conservancy (TNC) initiated a prairie nursery using seeds collected primarily from Indiana remnant prairie to provide locally collected genotypes for small-scale restoration projects. More recently, the Indiana TNC has begun a concerted effort to acquire local genotype prairie seed for the Fair Oaks farm site.

Alternative 4 - Endangered Species

The endangered species scenario focuses on the protection of federally listed species and on Indiana and Illinois state listed species. The protection of federally endangered and candidate species could be an important contribution of the proposed Refuge (Figure 11).

The federally endangered Mitchell's Satyr butterfly is restricted to a few sites mostly in Indiana and Michigan. One of the areas currently populated by Mitchell's satyr is a wetland complex in the eastern part of the watershed. The Indiana DNR and TNC currently protect some of this area, but a large portion remains in private ownership. Federally endangered Indiana bats have been located and presumably

continue to use the riparian corridor of the Kankakee River and tributary streams. The federally endangered Hine's Emerald dragonfly may also occur within the watershed although no sites are currently known. Action alternative 4 would protect essential riparian habitat along the Kankakee and Yellow Rivers for these species.

TABLE 2.3
Existing Land Use by Focus Area (in acres) in the Endangered Species Alternative

FOCUS AREA #	TOTAL	WETLAND	GRASSLANDS/ PASTURE	UPLAND FOREST	AGRICULTURE	URBAN
2	1434	497	41	186	710	0
4	988	40	10	30	889	19
5	431	108	20	22	281	0
6	2027	727	172	230	867	31
8	5807	2172	897	724	1995	35
17	3574	822	326	488	1911	27
18	4121	939	127	640	2401	14
19	7129	1491	291	609	4724	14
20	1420	379	20	191	830	0
21	9893	1967	180	1009	6726	11
22	421	175	16	61	169	0
TOTAL	37,061	9,317	1,900	4,190	21,503	151

One important goal for protected areas in highly modified and rapidly changing landscapes is to protect common species from becoming rare and rare species from extinction. Land use within the Kankakee River watershed has changed enormously from pre-settlement conditions, primarily from natural vegetation to agriculture. It is currently undergoing a second generation anthropogenic change from agricultural ecosystems to a more densely developed state aptly called "rurbanization" (Figure 8).

The effect of rurbanization on species dependent on the existing landscape could produce impacts as significant as those that resulted from the change from natural to agricultural ecosystems. An emerging concept in conservation biology is discontinuity and synergism which suggests that stresses to the environment can work in concert to produce rapid and unexpected environmental consequences (Myers 1996). Not only the most conservative species, but species that we cannot anticipate, could be extirpated as the watershed changes from rural to urban. The endangered species scenario would protect habitat in order to prevent species from becoming federally listed within the 2 states.

Alternative 5 - Hybrid Alternative (PREFERRED ALTERNATIVE)

The Hybrid scenario combines sites that would partly or completely achieve goals within the wetlands, grassland, and endangered species alternatives (Figure 12). The Hybrid alternative Focus Areas were selected from Focus Areas in alternatives 2 through 4. Alternative 5 addresses 4 of the 6 ecotypes

selected as focus areas in the Upper Mississippi/Tallgrass Prairie Ecosystem Action Plan (EAP). These include: prairie wetland and associated habitats; tallgrass prairie and associated habitats; oak savanna and forest lands, and riparian woodland corridors and associated habitats. This alternative and the EAP also agree in terms of proposing a landscape approach to the management of oak savannas. The process by which the Hybrid alternative Focus Areas were selected involved informally scoring each Focus Area using criteria A - G listed below.

The criteria are loosely weighted with A receiving the most weight and H the least.

A = FEDERALLY ENDANGERED SPECIES HABITAT

B = AREA SENSITIVE MIGRATORY GRASSLAND BIRD HABITAT

C = FUNCTIONS TO COMPLETE KANKAKEE RIVER CORRIDOR

D = CONNECTIVITY WITH EXISTING MANAGED AREAS

E = SWEEP OF STATE LISTED SPECIES

F = RATIO OF EXISTING TO RESTORABLE HABITAT

G = ABSENCE OF INTERNAL FRAGMENTATION BY DEVELOPMENT

H = FIT WITH OTHER FOCUS AREAS FOR LANDSCAPE MANAGEMENT

The Hybrid alternative is the Service preferred alternative because it gives the Service the greatest opportunity to both address trust resources and contribute to the conservation of biodiversity in the watershed. Since the Hybrid alternative spans the proposal study area, it also gives the Service great flexibility to: 1) work with partners and cooperators to manage at the landscape scale, and 2) work with willing sellers to acquire refuge land.

All of the challenges listed for alternatives 2 through 4 apply to the Hybrid alternative. Other challenges include: determining a measure of vulnerability in order to prioritize among sites offered by willing sellers, managing dispersed units, managing disparate ecosystem types, and cooperating with landholding agencies in the watershed. The Service has begun to address those issues critical to implementing the Hybrid alternative.

TABLE 2.4
Existing Land Use by Focus Area (in acres) in the Hybrid Alternative

FOCUS AREA #	TOTAL	WETLAND	GRASSLAND/ PASTURE	UPLAND FOREST	AGRICULTURE	URBAN
2	1434	497	41	186	710	0
4	988	40	10	30	889	19
5	431	108	20	22	281	0
6	2027	727	172	230	867	31
7	2504	15	228	708	1550	3
8	5807	2172	897	708	1995	35
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15	6736	71	2172	217	4137	139
17	3574	822	326	488	1911	27
18	4121	939	127	640	2401	14
19	7129	1491	291	609	4724	14
20	1420	379	20	191	830	0
22	421	175	16	61	169	0
TOTAL	51,013	7,544	9,718	6,594	26,760	397

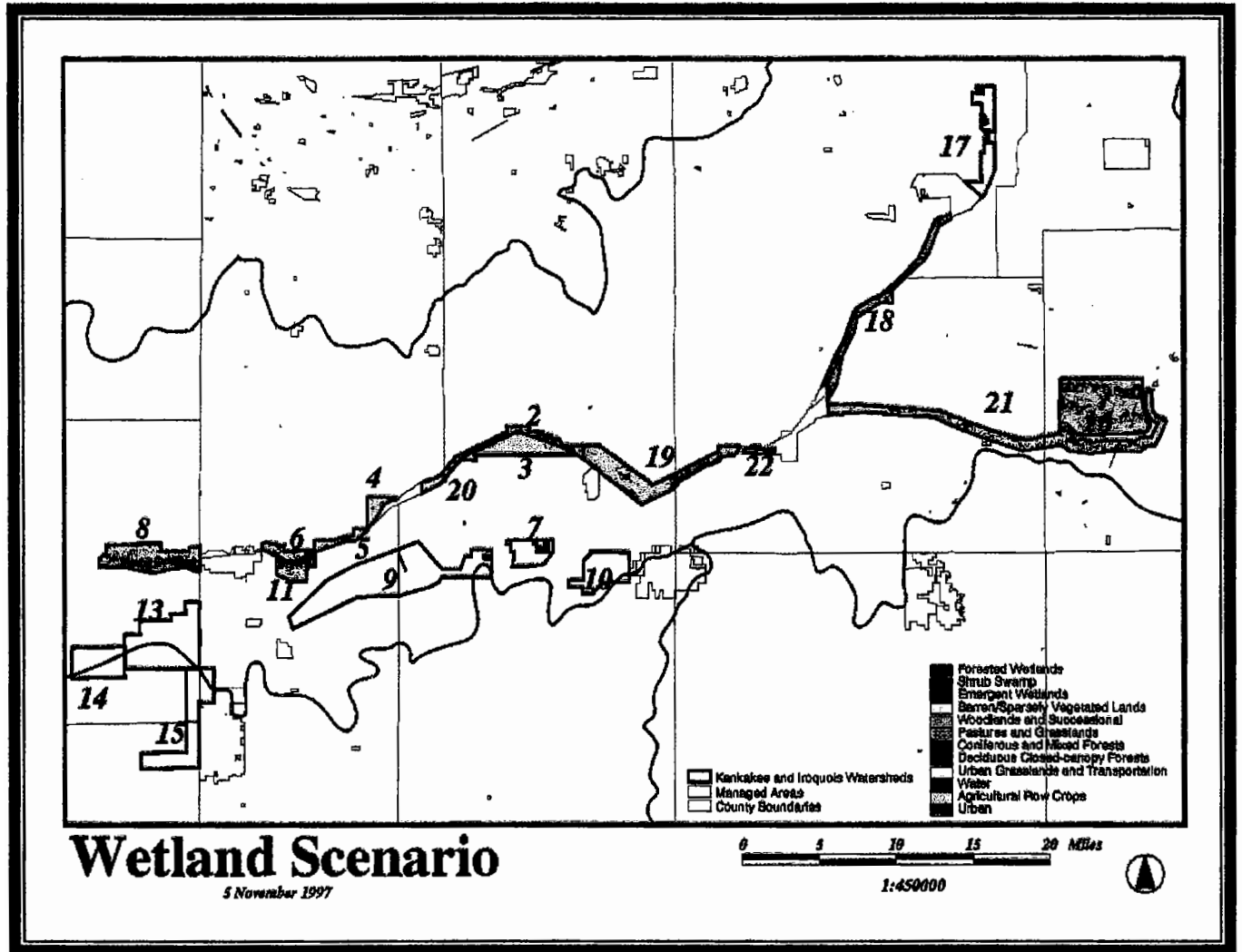


Figure 9 - Alternative 2

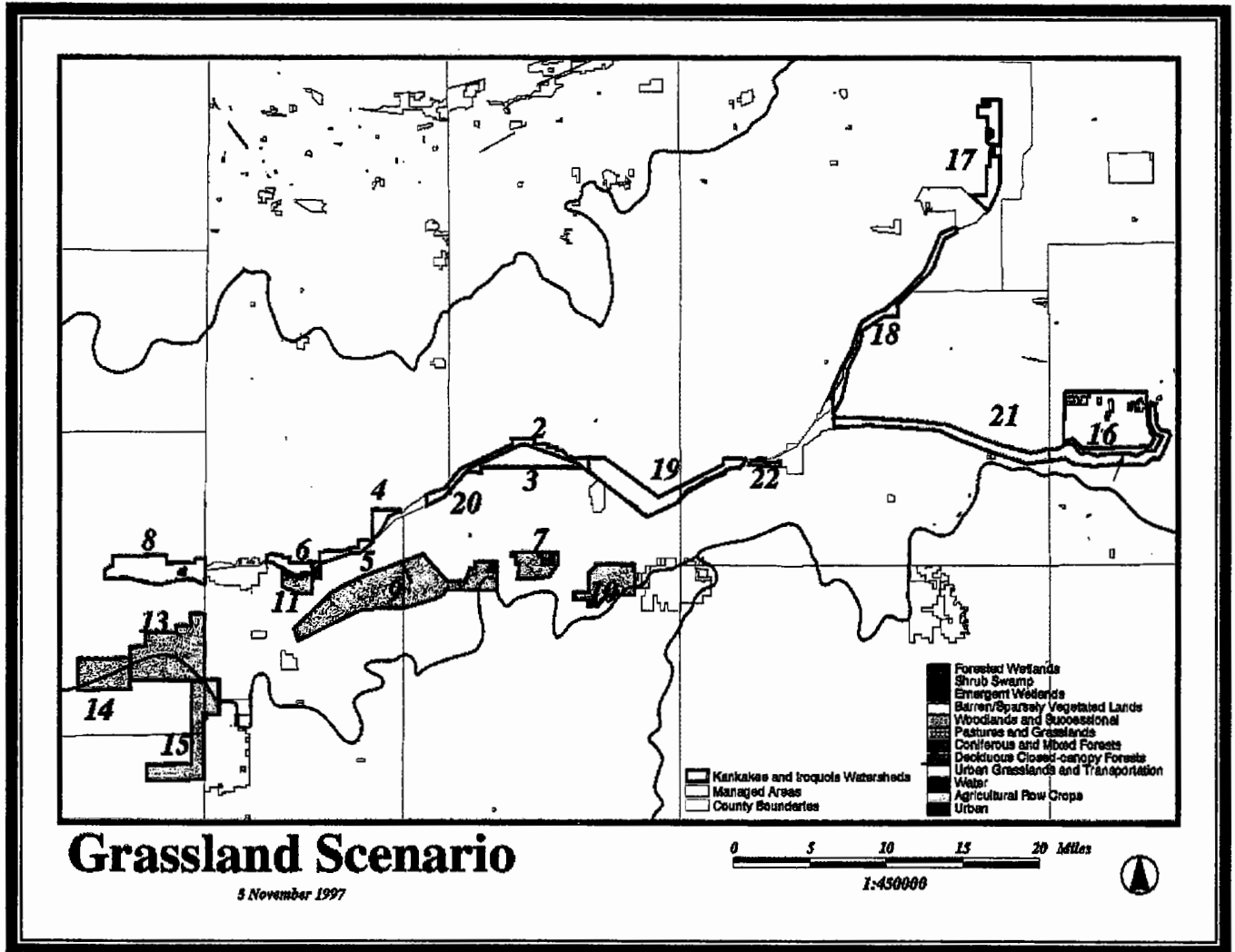


Figure 10 - Alternative 3

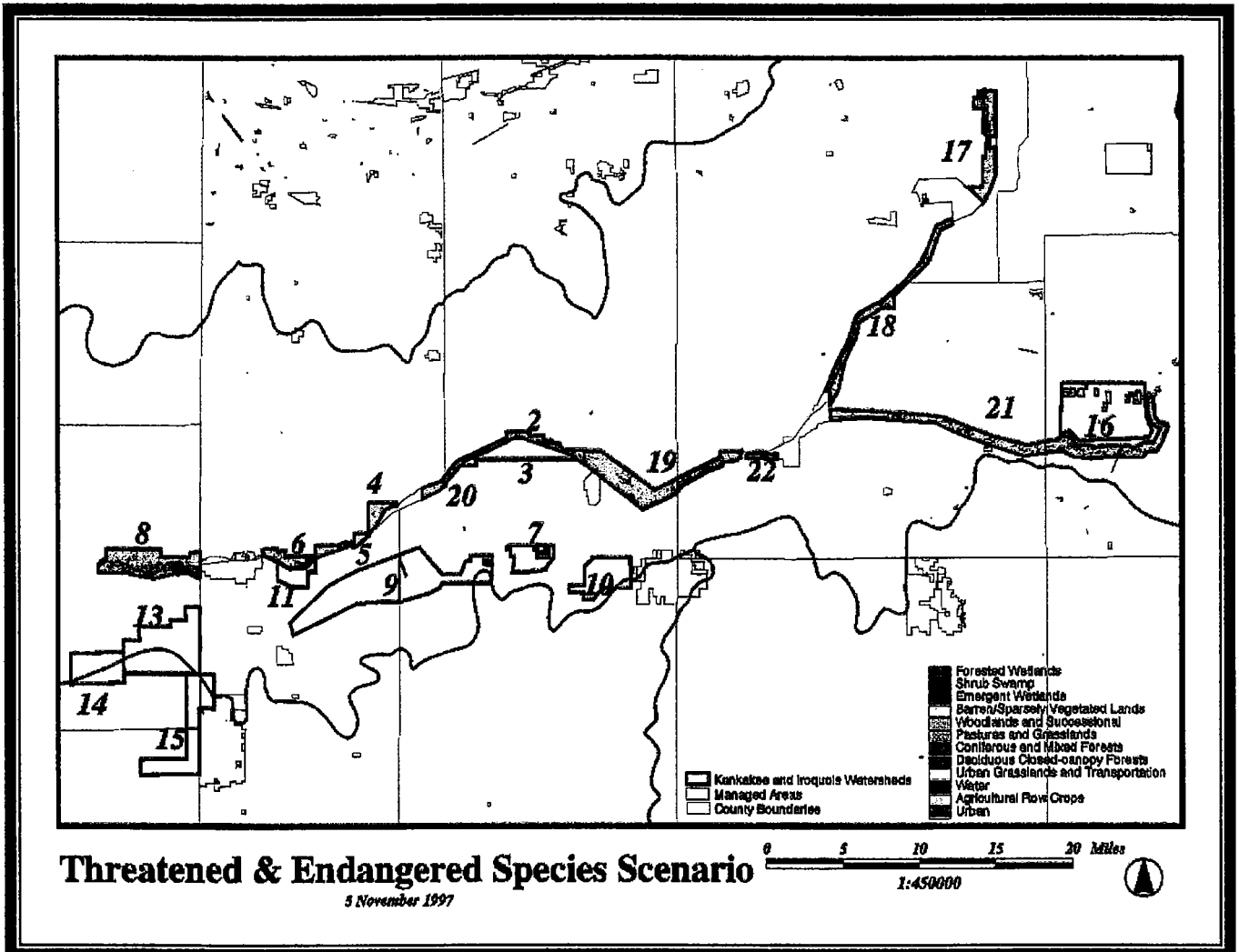


Figure 11 - Alternative 4

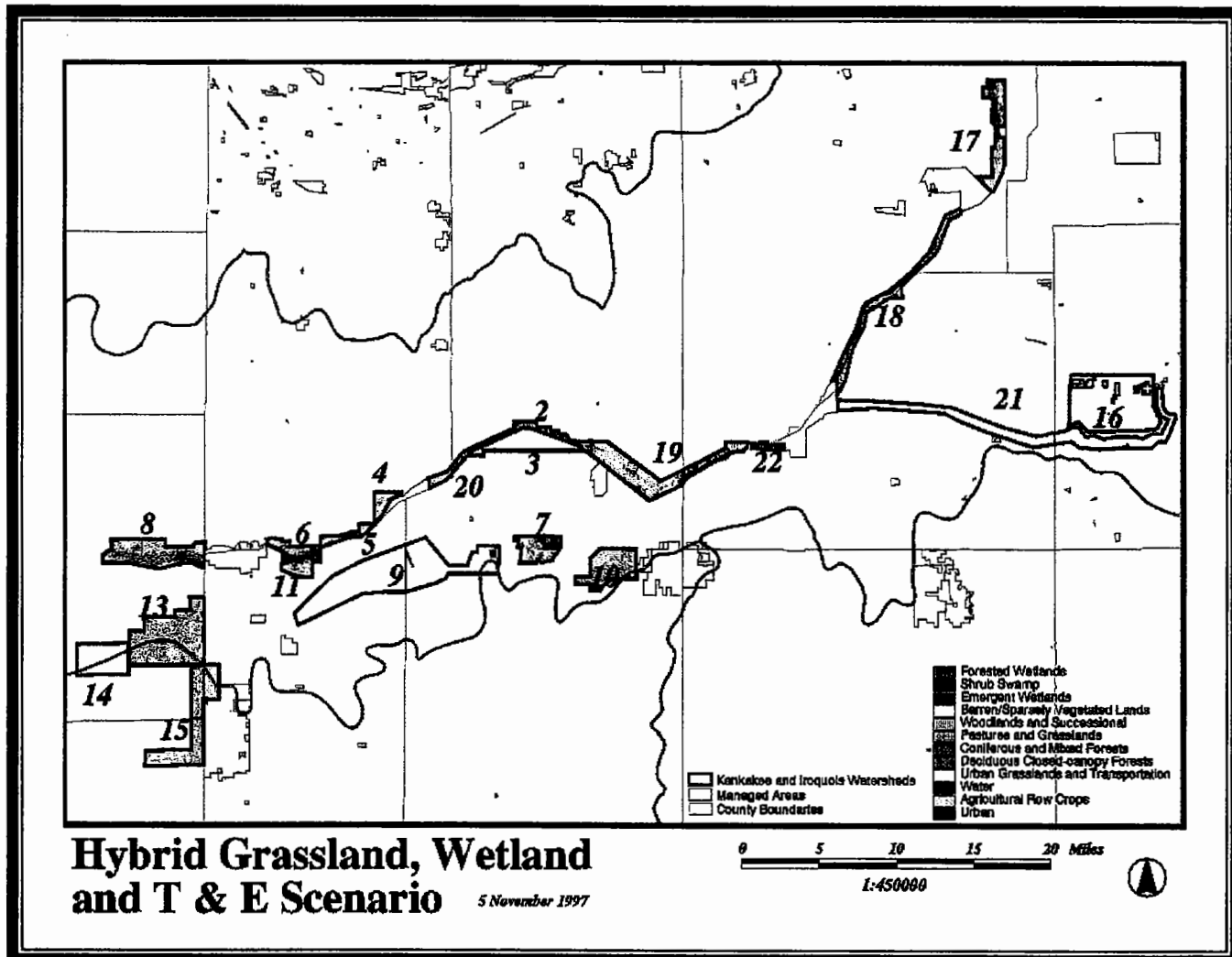


Figure 12 - Alternative 5

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