

# Appendix A

## *List of Preparers and Reviewers*

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# Appendix B

## *List of Plants and Animals*

### **Rainwater Basin Flora List for Waterfowl Production Areas, Version 2.0**

The U.S. Fish and Wildlife Service maintains a list of plant species (422) that occur in wetlands (<http://www.fws.gov/nwi/bha/list88.html>). The following list of plants for the Rainwater Basin was generated using the Region 5 (1,523 plant species) map from this Web site. The USDA Plants Web site (<http://plants.usda.gov>) listed 9,485 plant species for Nebraska. Both the USDA Plants Web site and the Nature Serve Explorer Web<sup>1</sup> site were used to verify scientific names, common names, and habits for those species not listed on the FWS Web site.

#### **SCIENTIFIC NAME**

The genus and species applied to the taxon were derived from Kaul et al. (2006) and Nature Serve Explorer (2010).

#### **COMMON NAME**

The common name is the popular name applied to the species. Common name selection generally follows common names from North American Plants<sup>2</sup> (Kartesz and Thieret 1991), but some common names follow the current common name list maintained by the Natural Resources Conservation Service and/or NatureServe.

#### **NATIONAL RANGE INDICATORS**

The national indicators reflect the range of estimated probabilities (expressed as a frequency of occurrence) of a species occurring in wetlands versus nonwetlands across the entire distribution of the species. A frequency of, for example, 67–99 percent (facultative wetland) means that 67–99 percent of sample plots containing the species randomly selected across the range of the species would be wetland. A question mark (?) following an indicator denotes a tentative assignment based on the botanical literature and not confirmed by regional review. When two indicators are given, they reflect the range from the lowest to the highest frequency of occurrence in wetlands across the regions in which

the species is found. A positive (+) or negative (-) sign was used with the facultative indicator categories to more specifically define the regional frequency of occurrence in wetlands. The positive sign indicates a frequency toward the higher end of the category (more frequently found in wetlands), and a negative sign indicates a frequency toward the lower end of the category (less frequently found in wetlands).

#### **NATIONAL WETLAND INDICATOR (INDICATOR CATEGORIES):**

- **Obligate Wetland (OBL).** These species almost always occur under natural conditions in wetlands (estimated probability >99 percent).
- **Facultative Wetland (FACW).** Usually occur in wetlands (estimated probability 67–99 percent), but occasionally found in nonwetlands.
- **Facultative (FAC).** Equally likely to occur in wetlands or nonwetlands (estimated probability 34–66 percent).
- **Facultative Upland (FACU).** Usually occur in nonwetlands (estimated probability 67–99 percent), but occasionally found in wetlands (estimated probability 1–33 percent).
- **Obligate Upland (UPL).** Occur in wetlands in another region, but occur almost always (estimated probability >99 percent) under natural conditions in nonwetlands in the region specified. If a species does not occur in wetlands in any region, it is not on the national list.

The wetland indicator categories should not be equated to degrees of wetness. Many obligate wetland species occur in permanently or semipermanently flooded wetlands, but a number of obligates also occur and some are restricted to wetlands that are only temporarily or seasonally flooded. The facultative upland species include a diverse collection of plants that range from weedy species adapted to exist in a number of environmentally stressful or disturbed sites (including wetlands) to species for which a portion of the gene pool (an ecotype) always occurs in wetlands. Both the weedy and ecotype representatives of the facultative upland category occur in seasonally and semipermanently flooded wetlands.

<sup>1</sup> <http://www.natureserve.org/explorer/>

<sup>2</sup> <http://www.unl.edu/agnicpls/gpcn/about.html>

**REGION 5 WETLAND INDICATOR (REGIONAL INDICATOR FOR 5-CENTRAL PLAINS NE, KS, AND CO [EASTERN])**

The wetland Indicator status estimates the probability (likelihood) of a species occurring in wetlands rather than nonwetland areas within this region. Regional indicators reflect the unanimous agreement of the Regional Interagency Review Panel. If a regional panel was not able to reach a unanimous decision on a species, NA (no agreement) was recorded on the regional indicator field. An NI (no indicator) was recorded for those species for which insufficient information was available to determine an indicator status. A nonoccurrence (NO) designation indicates that the species does not occur in that region. An asterisk (\*) following

a regional indicator identifies tentative assignments based on limited information from which to determine the indicator status.

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**HABIT**

The plant characteristics and life forms assigned to each species in the National List of Scientific Plant Names<sup>3</sup> (1982) and by the Natural Resources Conservation Service. Family names are listed alphabetically under specific life forms restricted to these families. The HABIT symbols are combined to describe the life form of the species (e.g., ANG means annual native grass, IT means introduced tree).

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<sup>3</sup> <http://www.archive.org/stream/nationallistofsc01unit#page/n11/mode/2up>

<i>Symbol</i>	<i>Characteristic or Life Form</i>		
A	Annual		
B	Biennial		
C	Clubmoss	Lycopodiaceae	Selaginellaceae
E	Emergent		
F	Forb		
/	Floating		
F3	Fern	Adiantaceae	Aspleniaceae
		Blechnaceae	Cyatheaceae
		Davalliaceae	Dennstaedtiaceae
		Dryopteridaceae	Gleicheniaceae
		Grammitidaceae	Hymenophyllaceae
		Lomariopsidaceae	Marattiaceae
		Ophioglossaceae	Osmundaceae
		Parkeriaceae	Polypodiaceae
		Psilotaceae	Pteridaceae
		Schizaeaceae	
G	Grass	Poaceae	
GL	Grasslike	Cyperaceae	Juncaceae
H	Partly woody		
HS	Half shrub		
H2	Horsetail	Equisetaceae	
I	Introduced		
N	Native		
P	Perennial		
+	Parasitic		
P3	Pepperwort	Marsileaceae	
Q	Quillwort	Isoetaceae	
S	Shrub		
-	Saprophytic		
Z	Submerged		
\$	Succulent		
T	Tree		
V	Herbaceous vine		
W	Waterfern	Azollaceae	Salviniaceae
WV	Woody vine		

<b>Plants</b>				
<i>Scientific Name</i>	<i>Common Name</i>	<i>Region 5 Wetland Indicator</i>	<i>National Wetland Indicator</i>	<i>Habit</i>
<i>Abutilon theophrasti</i>	velvetleaf	UPL-FACU-	UPL	AIF
<i>Achillea millefolium</i>	common yarrow	FACU	FACU	PNF
<i>Agropyron elongatum</i>	tall wheatgrass	FAC, FACU*	NI	PNG*
<i>Agropyron cristatum</i>	crested wheatgrass	FACU		PIG
<i>Agropyron smithii</i>	western wheatgrass	FACU	UPL, FAC-	PNG
<i>Agrostis hyemalis</i>	ticklegass	FACU	FACU, FACW	PNG
<i>Agrostis stolonifera</i>	redtop	FAC+, FACW	FAC+	PIG
<i>Alisma plantago-aquatica</i>	European water plantain	OBL	OBL	PNEF
<i>Alisma subcordatum</i>	American water plantain	OBL	OBL	PNEF
<i>Allium canadense</i>	meadow onion	FACU-, FACU	FACU	PNF
<i>Allium canadense</i> var. <i>lavendulare</i>	meadow onion	FACU-, FACU	FACU	PNF
<i>Alopecurus aequalis</i>	shortawn foxtail			PNG
<i>Alopecurus arundinaceus</i>	creeping foxtail	FACW	FAC+, FACW	PIG
<i>Alopecurus carolinianus</i>	Carolina foxtail	FACW	FAC+, FACW	ANG
<i>Amaranthus arenicola</i>	sandhill amaranth	UPL, FAC	FACU	ANF
<i>Amaranthus retroflexus</i>	redroot amaranth	FACU	FACU-, FAC-	ANF
<i>Amaranthus rudis</i>	amaranth	FACW	FACU-, FACW	ANF
<i>Ambrosia artemisiifolia</i>	annual ragweed	FACU	FACU-, FACU+	ANF
<i>Ambrosia grayi</i>	woollyleaf burr ragweed	FAC	FAC, FACW	PNF
<i>Ambrosia psilostachya</i>	naked-spike ragweed	FAC	FACU-, FAC	PNF
<i>Ambrosia trifida</i>	great ragweed	FACW	FAC, FACW	ANF
<i>Ammannia coccinea</i>	valley redstem	OBL	FACW+, OBL	ANF
<i>Amorpha canescens</i>	leadplant	FAC*	NI	PNF*
<i>Andropogon gerardii</i>	big bluestem	FAC-	FACU, FAC	PNG
<i>Apocynum cannabinum</i>	clasping-leaf dogbane	FAC	FACU, FAC+	PNF
<i>Argemone polyanthemus</i>	crested pricklypoppy	UPL	NI	PNF
<i>Aristida basiramea</i>	Vasey-forktip grass		NI	ANG
<i>Aristida oligantha</i>	three-awn grass	FACU*	NI	PNG*
<i>Aristida purpurea</i>	red three-awn grass		NI	PNG*
<i>Artemisia ludoviciana</i>	white sagebrush	FACU-	UPL, FACU	PNFH
<i>Asclepias incarnata</i>	swamp milkweed			PNF*
<i>Asclepias stenophylla</i>	slim-leaved milkweed	FACU*	NI	PNF*
<i>Asclepias syriaca</i>	common milkweed	FACW-*	NI	PNF
<i>Asclepias verticillata</i>	whorled milkweed	UPL		PNF
<i>Asclepias viridiflora</i>	woolly milkweed	UPL		PNF
<i>Asclepias viridis</i>	green antelopehorn	UPL		PNF
<i>Aster</i> spp. <i>See Symphyotrichum</i>				
<i>Astragalus canadensis</i>	Canadian milkvetch	FACU	FACU, FACW-	PNF
<i>Astragalus crassicaarpus</i>	groundplum milkvetch	UPL		PNF
<i>Avena fatua</i>	wild oats			AIG
<i>Azolla mexicana</i>	Mexican mosquito fern	OBL	OBL	PN/W
<i>Bacopa rotundifolia</i>	disk water-hyssop	OBL	OBL	PNF

## Plants

<i>Scientific Name</i>	<i>Common Name</i>	<i>Region 5 Wetland Indicator</i>	<i>National Wetland Indicator</i>	<i>Habit</i>
<i>Baptisia bracteata</i>	long-bract indigo	UPL		PNF
<i>Bassia scoparia</i>	kochia			ANF
<i>Berula erecta</i>	water parsnip	OBL	OBL	PIF
<i>Bidens cernua</i>	nodding beggar-ticks	OBL	FACW+, OBL	AIF
<i>Bidens comosa</i>	leafy-bract beggar-ticks	FACW	FACW	ANF
<i>Bidens frondosa</i>	devil's beggar-ticks	FACW	FACW, FACW+	ANF
<i>Bidens vulgata</i>	beggar-ticks			ANF
<i>Boltonia asteroides</i>	white boltonia	FACW	FACW, OBL	PNF
<i>Bouteloua curtipendula</i>	sideoats grama	FACU*	NI	PNG*
<i>Bouteloua gracilis</i>	blue grama	UPL*	NI	PNG*
<i>Bouteloua hirsuta</i>	hairy grama	UPL*	NI	PNG*
<i>Brickellia eupatorioides</i>	false boneset	UPL		PNF*
<i>Bromus inermis</i>	smooth brome	UPL*	NI	PNG*
<i>Bromus japonicus</i>	Japanese brome	FACU	FACU, UPL	AIG
<i>Bromus tectorum</i>	downy brome	UPL*	NI	ANG*
<i>Bryophyte spp.</i>	moss	NI	NI	NI
<i>Buchloe dactyloides</i>	buffalograss	FACU	FACU-, FACU	PNG
<i>Calamagrostis canadensis</i>	bluejoint reedgrass	OBL	FAC, OBL	PNG
<i>Calamagrostis stricta</i>	northern reedgrass			PNG
<i>Calamovilfa longifolia</i>	prairie sandreed	UPL		PNG
<i>Callirhoe alcaeoides</i>	light poppymallow	UPL		PNF
<i>Callirhoe involucrata</i>	purple poppymallow	UPL		PNF
<i>Calylophus serrulatus</i>	yellow sundrops	UPL		PNF
<i>Calystegia sepium</i>	hedge bindweed	FACU, OBL	FAC	PIF
<i>Cannabis sativa</i>	hemp	FAC+*	NI	ANF*
<i>Capsella bursa-pastoris</i>	common shepherd's purse	FACU	FACU, FAC	AIF
<i>Cardus nutans</i>	musk thistle	UPL		B/PIF*
<i>Carex bicknellii</i>	Bicknell's sedge	FACU, FACW	FACU	PNGL
<i>Carex brevior</i>	short-beak sedge	FAC	UPL, OBL	PNEGL
<i>Carex cristatella</i>	crested sedge	FACW	FAC, FACW+	PNGL
<i>Carex eleocharis</i>	needle leaf sedge	FACW		PNGL
<i>Carex gravida</i>	heavy sedge	OBL*		PNGL
<i>Carex laeviconica</i>	smooth-cone sedge	OBL	OBL	PNEGL
<i>Carex lanuginosa</i>	woolly sedge	OBL	OBL	PNGL
<i>Carex tribuloides</i>	blunt broom sedge	FACW, OBL	FACW	PNGL
<i>Carex vulpinoidea</i>	fox sedge	OBL	OBL	PNEGL
<i>Carex × stipata</i>	stalk-grain sedge	OBL	OBL	PNGL
<i>Cassia chamaecrista</i>	showy partridge pea	UPL		ANF
<i>Ceanothus americanus</i>	New Jersey tea	UPL		PNF
<i>Ceanothus herbaceus</i>	Jersey tea	UPL		PNS
<i>Celtis occidentalis</i>	hackberry			PNT
<i>Celtis occidentalis</i>	common hackberry	UPL		PNT
<i>Cenchrus longispinus</i>	sandbur	FAC*	NI	ANG*
<i>Chenopodium album</i>	lambsquarters	FAC	FACU, FAC	AIF

<b>Plants</b>				
<i>Scientific Name</i>	<i>Common Name</i>	<i>Region 5 Wetland Indicator</i>	<i>National Wetland Indicator</i>	<i>Habit</i>
<i>Chenopodium desiccatum</i>	aridland goosefoot	UPL		ANF
<i>Chenopodium leptophyllum</i>	narrowleaf goosefoot	NI	UPL, FAC	ANF
<i>Chloris verticillata</i>	windmill grass	NI	NI	PNG
<i>Cichorium intybus</i>	chicory			BPIF
<i>Circaea</i> spp.	enchanter's nightshade	FACW, UPL		PNF
<i>Cirsium altissimum</i>	roadside thistle	FAC*	NI	BNF*
<i>Cirsium arvense</i>	Canada thistle	FACU	FACU-, FAC	PIF
<i>Cirsium canescens</i>	prairie thistle	UPL		BNF*
<i>Cirsium flodmanii</i>	Flodman's thistle	NI	FACU?	PNF
<i>Cirsium ochrocentrum</i>	yellowspine thistle	UPL		BPNF
<i>Cirsium</i> spp.	thistles	FAC+*	NI	ABINF*
<i>Cirsium undulatum</i>	wavy-leaf thistle	FACU	FACU, FAC	BPNF
<i>Cirsium vulgare</i>	bull thistle	UPL	UPL, FAC	BIF
<i>Comandra umbellata</i>	umbellate bastard toad-flax	UPL, FACU	UPL	PN+F
<i>Convolvulus</i> spp.	field bindweed	FAC*	NI	PNF*
<i>Convolvulus arvense</i>	field bindweed	FAC*	NI	PNF*
<i>Conyza canadensis</i>	Canada horseweed	FACU-	UPL, FAC	ANF
<i>Conyza ramosissima</i>	dwarf horseweed	FAC*	NI	AN F
<i>Coreopsis tinctoria</i>	golden tickseed	FAC	FACU, FAC	ANF
<i>Crepis runcinata</i>	hawksbeard dandelion	FAC	FACU, FACW	PNF
<i>Cyclachaena xanthifolia</i>	giant sumpweed			ANF
<i>Cyperus acminatus</i>	short-point flatsedge	OBL	OBL	ABPNGL
<i>Cyperus aristatus</i>	awned flatsedge	OBL	FACW+, OBL	ANGL
<i>Cyperus erythrorhizos</i>	redrooted cyperus	OBL	FACW+, OBL	APNEGL
<i>Cyperus esculentes</i>	chufa	FACW	FAC, FACW	PNGL
<i>Cyperus lupulinus</i>	Houghton flatsedge	FACU		PNG
<i>Dactylis glomerata</i>	orchard grass	UPL		PIG
<i>Dalea candida</i>	white prairie clover	UPL		PNF
<i>Dalea purpurea</i>	violet prairie clover	UPL		PNF
<i>Dalea villosa</i>	silky prairie clover	UPL		PNFHHS
<i>Delphinium carolinianum</i>	Carolina larkspur	UPL		PNF
<i>Delphinium virescens</i>	prairie larkspur	UPL		PNF
<i>Desmanthus illinoensis</i>	prairie bundleflower	FACU	UPL, FAC	PNF
<i>Desmodium canadense</i>	showy tick-trefoil	FAC	FACU, FAC	PNF
<i>Desmodium illinoense</i>	Illinois tick-trefoil	UPL		PNF
<i>Dianthus armeria</i>	Deptford pink	UPL		PNF
<i>Dichanthelium acuminatum</i>	panic grass	FAC, FACW	FAC	PNG
<i>Dichanthelium oligosanthes</i>	Heller's witchgrass	FACU	FACU, FAC	PNG
<i>Digitaria sanguinalis</i>	hairy crabgrass	FACU	FACU-, FAC-	AIG
<i>Digitaria spicata</i>	saltgrass			PNG
<i>Echinacea angustifolia</i>	blacksamson echinacea	UPL		PNG
<i>Echinochloa crus-galli</i>	barnyard grass	FACW	FACU, FACW	AIG
<i>Echinochloa muricata</i>	rough barnyard grass	OBL	FAC, OBL	ANG
<i>Elatine rubella</i>	red waterwort			ANF

## Plants

<i>Scientific Name</i>	<i>Common Name</i>	<i>Region 5 Wetland Indicator</i>	<i>National Wetland Indicator</i>	<i>Habit</i>
<i>Eleusine indica</i>	goosegrass			AIG
<i>Eleocharis acicularis</i>	least spikerush	OBL	OBL	PNEGL
<i>Eleocharis compressa</i>	flat-stem spikerush	FACW	FACW, FACW+	PNEGL
<i>Eleocharis engelmannii</i>	annual spikerush	OBL	OBL	ANGL
<i>Eleocharis erythropoda</i>	bald spikerush	OBL	OBL	PNGL
<i>Eleocharis palustris</i>	creeping spikerush	OBL	OBL	PNEGL
<i>Elymus canadensis</i>	nodding wild rye	FACU	FACU, FAC+	PNG
<i>Elymus elongatus</i>	tall wheatgrass			PIG
<i>Elymus hispidus</i>	intermediate wheatgrass	FACU	FACU, FAC+	PNG
<i>Elymus repens</i>	quackgrass			PIG
<i>Elymus smithii</i>	western wheatgrass	FACU		PNG
<i>Elymus trachycaulus</i>	slender wheatgrass	FACU		PNG
<i>Elymus virginiana</i>	Virginia wild rye	FAC	FAC, FACW	PNG
<i>Eragrostis cilianensis</i>	stinkgrass			AIG
<i>Eragrostis hypnoides</i>	teal lovegrass	FACU		ANG
<i>Eragrostis pectinacea</i>	Carolina lovegrass			ANG
<i>Eragrostis spectabilis</i>	purple lovegrass	FACU	UPL, FACU	PNG
<i>Eragrostis spectabilis</i>	purple lovegrass	FACU	UPL, FACU	PNG
<i>Erigeron annuus</i>	white-top fleabane	FACU	FACU, FAC	ANF
<i>Erigeron philadelphicus</i>	Philadelphia fleabane	FACU	FACU, FAC	ANF
<i>Erigeron strigosus</i>	prairie fleabane	FAC	FACU, FAC	ANF
<i>Eriochloa contracta</i>	prairie cupgrass			ANG
<i>Eupatorium perfoliatum</i>	common boneset	OBL	FACW+, OBL	PNF
<i>Euphorbia cyathophora</i>	fire-on-the-mountain	UPL		NAPF
<i>Euphorbia esula</i>	leafy spurge	UPL		PIF
<i>Euphorbia glyptosperma</i>		UPL		ANF
<i>Euphorbia dentata</i>	toothed spurge	UPL		AIF
<i>Euphorbia maculata</i>	spotted spurge	FACU-	UPL, FACU	ANF
<i>Euphorbia marginata</i>	snow-on-the-mountain	UPL, FACU	FACU	ANF
<i>Euphorbia prostrata</i>				ANF
<i>Euphorbia nutans</i>	eyebane broomspurge	FACU-, FACU	FACU-	AIF
<i>Euphorbia serpens</i>	round-leafed spurge			ANF
<i>Euphorbia spathulata</i>				ANF
<i>Festuca arundinacea</i>	Kentucky fescue	FACU	UPL, FACW-	PIG
<i>Festuca saximontana</i>	Rocky Mountain fescue			NPG
<i>Fragaria virginiana</i>	Virginia strawberry	UPL, FAC	FACU	PNF
<i>Fraxinus pennsylvanica</i>	green ash		FAC, FACW	NT
<i>Gaillardia pulchella</i>	blanket flower	UPL		PNF
<i>Galium aparine</i>	catchweed bedstraw	FACU	FACU, FAC-	ANF
<i>Gaura coccinea</i>	scarlet gaura	UPL		PNS/F
<i>Gaura parviflora</i>	velvet-leaf butterfly-weed	FACU?	NI	ANF
<i>Gleditsia triacanthos</i>	honey-locust	FAC	FACU, FAC	NTS
<i>Glyceria striata</i>	fowl mannagrass	OBL	OBL	PNEG
<i>Glycine max</i>	soybean	UPL*	NI	AI*

<b>Plants</b>				
<i>Scientific Name</i>	<i>Common Name</i>	<i>Region 5 Wetland Indicator</i>	<i>National Wetland Indicator</i>	<i>Habit</i>
<i>Glycyrrhiza lepidota</i>	American licorice	FACU	UPL, FAC+	PNF
<i>Grindelia squarrosa</i>	curly-cup gumweed	FACU-	UPL, FACU	ABPNF
<i>Gutierrezia sarothrae</i>	broom snakeweed	UPL		PNS/F
<i>Hedeoma hispida</i>	rough false pennyroyal	UPL		ANF
<i>Helianthus annuus</i>	common sunflower	FACU	FACU, FAC	ANF
<i>Helianthus grosseserratus</i>	saw-tooth sunflower	FACW	FAC, FACW	PNF
<i>Helianthus maximiliani</i>	Maximilian's sunflower	UPL	UPL, FACU	PNF
<i>Helianthus petiolaris</i>	prairie sunflower	UPL		ANF
<i>Helianthus rigidus</i>	stiff sunflower	UPL		PNF
<i>Hesperis matronalis</i>	dame's rocket			IBPF
<i>Heteranthera limosa</i>	blue mud-plantain	OBL	OBL	ANEF
<i>Heteranthera multiflora</i>	bouquest mud-plantain	OBL		ANF
<i>Heterotheca villosa</i>	hairy goldaster	UPL		PNF
<i>Hieracium longipilum</i>	hairy hawkweed	FACU		PNF
<i>Hordeum jubatum</i>	fox-tail barley	FACW	FAC, FACW	PNG
<i>Hordeum pusillum</i>	little barley	FAC	FACU, FAC	ANG
<i>Hypoxis hirsuta</i>	eastern yellow stargrass	FAC, FACW	FACW	PNF
<i>Ipomoea hederacea</i>	ivyleaf morning-glory	FACU, FAC	FACU	AIV
<i>Ipomoea leptophylla</i>	bush morning-glory	UPL		PNF
<i>Ipomoea pandurata</i>	wild sweet-potato vine	FACU, FAC-	FAC-	PNF
<i>Ipomoea purpurea</i>	common morning-glory	UPL, FAC	FACU	AIV
<i>Juncus dudleyi</i>	Dudley rush			PNGL
<i>Juncus interior</i>	inland rush	FAC	FACU, FACW	PNGL
<i>Juncus torreyi</i>	Torrey's rush	FACW, FACW+	FACW	PNGL
<i>Juniperus virginiana</i>	eastern red cedar	FACU-	FACI-, FACU	NT
<i>Kochia scoparia</i>	Mexican summer-cypress	FACU	UPL, FAC	AIF
<i>Koeleria macrantha</i>	prairie Junegrass	UPL		PNG
<i>Kuhnia eupatoriodes</i>	false boneset	FAC, FACU*	NI	PNF*
<i>Lactuca canadensis</i>	tall yellow lettuce	FACU	FACU-, FAC+	ABNF
<i>Lactuca ludoviciana</i>	biannual lettuce	FAC	UPL, FAC	BPNF
<i>Lactuca serriola</i>	prickly lettuce	FAC	FACU, FAC	ABIF
<i>Lactuca tatarica</i>	blue lettuce	FAC		BPNF
<i>Lamium amplexicaule</i>	henbit			AIF
<i>Leersia oryzoides</i>	rice cutgrass	OBL	OBL	PNG
<i>Lemna minor</i>	lesser duckweed	OBL	OBL	PN/F
<i>Lemna trisulca</i>	star duckweed	OBL	OBL	PN/F
<i>Lepidium densiflorum</i>	common pepperweed	FAC		ABNF
<i>Lepidium virginicum</i>	Virginia pepperweed	UPL, FAC-	FACU	ABNF
<i>Leptochloa fusca (fascicularis)</i>	bearded sprangletop	OBL	FACW, OBL	ANG
<i>Lespedeza capitata</i>	round-head bushclover	UPL	UPL, FACU	PNF
<i>Liatris punctata</i>	dotted gayfeather	FACU		PNF
<i>Liatris pycnostachya</i>	cattail gayfeather	FAC	FACU, FAC+	PNF
<i>Limosella aquatica</i>	northern mudwort	OBL	OBL	APNEF
<i>Lindernia dubia</i>	yellowseed false pimpernel	OBL		ANF

**Plants**

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<i>Linum compactum</i>	bushy flax			ANF
<i>Linum rigidum</i>	stiffstem flax	UPL, FAC	UPL	PNF
<i>Linum sulcatum</i>	grooved flax			ANF
<i>Lippia cuneifolia</i>	wedgeleaf fogfruit	FAC, FACW	FAC	PNF
<i>Lippia lanceolata</i>	northern fogfruit	FACW, OBL	OBL	PNF
<i>Lithospermum incisum</i>	narrow-leaved puccoon	UPL		PNF
<i>Lolium arundinaceum</i>	tall fescue	UPL		PIG
<i>Lolium perenne</i>	perennial ryegrass	UPL		PIG
<i>Lomatium foeniculaceum</i>	wild parsley	UPL		PNF
<i>Lonicera morrowii</i>	Morrow's honeysuckle			PIS
<i>Lotus corniculatus</i>	bird's-foot trefoil	FACU	FACU-, FAC	PIF
<i>Lotus purshianus</i>	prairie trefoil	FACU*	NI	ANF*
<i>Lotus unifoliolatus</i>	American bird's-foot trefoil			ANF
<i>Ludwigia palustris</i>	marsh seedbox	OBL	OBL	PNEF
<i>Lycopus americanus</i>	American bugleweed	OBL	OBL	PNF
<i>Lygodesmia juncea</i>	rush skeletonplant	UPL		PNF
<i>Lythrum salicaria</i>	purple loosetrife	FACW+, OBL	OBL	PIF
<i>Marsilea vestita</i>	hairy water fern	OBL	OBL	PNEP3
<i>Medicago sativa</i>	alfalfa			APIF
<i>Melilotus alba</i>	white sweetclover	FACU	FACU-, FACU+	ABIF
<i>Melilotus officinalis</i>	yellow sweetclover	FACU	FACU-, FACU+	ABIF
<i>Mentha arvensis</i>	field mint	FAC, FACW	FACW	PNF
<i>Mirabilis linearis</i>	narrowleaf four o'clock			PNFHS
<i>Mirabilis nyctaginea</i>	heartleaf four o'clock	UPL	UPL, FACU	PNF
<i>Mollugo verticillata</i>	green carpet-weed	FAC	FAC-, FAC	ANF
<i>Monarda fistulosa</i>	wild bergamot	UPL, FAC+	FACU-	PNF
<i>Morus alba</i>	white mulberry	UPL, FAC	FAC	IT
<i>Morus rubra</i>	red mulberry	FACU	FACU, FAC	NT
<i>Muhlenbergia asperifolia</i>	Parodi scratchgrass			PNG
<i>Muhlenbergia mexicana</i>	wirestem muhly	FACW	FAC, FACW	PNG
<i>Muhlenbergia racemosa</i>	green muhly	FACW	FACU, FACW	PNG
<i>Myosurus minimus</i>	tiny mouse-tail	FACW	FACW-OBL	ANF
<i>Nepeta cataria</i>	catnip	FACU	FACU-, FACW-	PIF
<i>Oenothera biennis</i>	common evening-primrose	FACU	FACU-, FACU+	BIF
<i>Oenothera villosa</i>	hairy evening-primrose	FAC	FACU, FACW	BPNF
<i>Oligoneuron rigidum</i>	goldenrod	UPL		PNF
<i>Oxalis dillenii</i>	gray-green woodsorrel	FACU*	NI	PNF*
<i>Oxalis stricta</i>	yellow woodsorrel	FACU*		PNF
<i>Oxalis violacea</i>	violet woodsorrel	UPL		PNF
<i>Panicum capillare</i>	witchgrass	FAC	FACU, FAC	ANG
<i>Panicum dichotomiflorum</i>	fall panic grass	FAC	FAC, FACW	ANG
<i>Panicum oligosanthes</i>	Scribner panicum			PNG
<i>Panicum virgatum</i>	switchgrass	FAC	FAC, FACW	PNG
<i>Paspalum setaceum</i>	paspalum			PNG

<b>Plants</b>				
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<i>Parientaria pennsylvanica</i>	Pennsylvania pellitory	FAC	FACU-, FACW-	ANF
<i>Penstemon grandiflorus</i>	large-flower beardtongue	UPL		PNF
<i>Phalaris arundinacea</i>	reed canarygrass	FACW+	FACW, OBL	PI*G
<i>Phleum pratense</i>	timothy	FACU	FACU	PIG
<i>Phragmites americanus</i>	australis reed	FACW-OBL		PNG
<i>Phragmites australis</i>	reed	FACW-OBL		PI*G
<i>Physalis heterophylla</i>	clammy groundcherry	UPL		PNF
<i>Physalis longifolia</i>	longleaf groundcherry	UPL		PNF
<i>Physalis virginiana</i>	Virginia groundcherry	UPL		PNF
<i>Poa annua</i>	tufted bluegrass	FACU, FACW-	FACU	AIG
<i>Poa compressa</i>	Canada bluegrass	FACU	FACU-, FAC	PIG
<i>Poa pratensis</i>	Kentucky bluegrass	FACU	FACU, FAC-	PIG
<i>Polygala alba</i>	white milkwort			PNF
<i>Polygonum arenastrum</i>	knotweed	UPL*	NI	APNF*
<i>Polygonum bicorne</i>	pink smartweed	FACW+	FACW-, OBL	ANEF
<i>Polygonum coccineum</i>	water smartweed	OBL	OBL	PNE/F
<i>Polygonum convolvulus</i>	black-bindweed			AIVF
<i>Polygonum hydropiper</i>	swamp smartweed	OBL	OBL	PNEF
<i>Polygonum hydropiperoides</i>	mild water-pepper	OBL	OBL	PNEF
<i>Polygonum lapathifolium</i>	curlytop knotweed	OBL	FAC, OBL	ANF
<i>Polygonum pensylvanicum</i>	Pennsylvania	FACW+	FACW-, OBL	ANEF
<i>Polygonum persicaria</i>	spotted ladythumb	OBL	FAC, OBL	AIF
<i>Polygonum minus</i>	pygmy smartweed	OBL		APIF
<i>Polygonum punctatum</i>	dotted smartweed	OBL	FACW, OBL	PNEF
<i>Polygonum ramosissimum</i>	bushy knotweed	FAC	FACU-, FACW	ANF
<i>Polygonum scandens</i>	climbing false buckwheat			PNVF
<i>Polypogon monspeliensis</i>	rabbitfoot grass	FACW, OBL	OBL	AIG
<i>Populus deltoides</i>	eastern cottonwood	FAC	FAC, FACW	NT
<i>Portulaca oleracea</i>	common purslane	FAC	FACU, FAC	ANF
<i>Potamogeton gramineus</i>	variable pondweed	OBL	OBL	PNZF
<i>Potamogeton nodosus</i>	longleaf pondweed	OBL	OBL	PNZF
<i>Potentilla arguta</i>	tall cinquefoil	FACU	UPL, FACU+	PNF
<i>Potentilla norvegica</i>	Norwegian cinquefoil	FAC	FACU, FAC	ABPNF
<i>Potentilla recta</i>	sulphur cinquefoil	FACU*	NI	PNF*
<i>Prenanthes racemosa</i>	glaucous rattlesnake-root	FAC	FACU-, FACW	PNF
<i>Prunella vulgaris</i>	heal-all	FAC	FACU, FACW	PIF
<i>Prunus americana</i>	American plum	UPL	UPL, FACU	NST
<i>Prunus virginiana</i>	chokecherry	FACU	FACU-, FAC	NST
<i>Psoralea argophylla</i>	silver-leaf scurfpea	FACU*	NI	PNF*
<i>Psoralea tenuiflora</i>	few-flowered scurfpea	UPL		PNF
<i>Psoralidium lanceolatum</i>	lemon scurfpea	UPL		PNF
<i>Pulsatilla patens</i>	pasqueflower	UPL		PNF
<i>Ranunculus cymbalaria</i>	shore buttercup	OBL	OBL	PNEF
<i>Ranunculus flabellaris</i>	yellow water buttercup	OBL	OBL	PNEF

**Plants**

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<i>Ranunculus longirostris</i>	white water buttercup	OBL	OBL	PNZ/F
<i>Ranunculus pennsylvanicus</i>	Pennsylvania buttercup	FACW, OBL	OBL	APNEF
<i>Ranunculus sceleratus</i>	cursed buttercup	OBL	OBL	APNEF
<i>Ratibida columnifera</i>	upright prairie coneflower	UPL		PNF
<i>Rhus glabra</i>	smooth sumac	UPL		NT
<i>Robinia pseudoacacia</i>	black locust	UPL	UPL, FAC	IT
<i>Rorippa palustris</i>	bog yellowcress	OBL	FAC, OBL	ANEF
<i>Rorippa sessiliflora</i>	stalkless yellowcress	OBL	FACW+, OBL	ANEF
<i>Rorippa sinuata</i>	spreading yellowcress	FACW	FAC+, FACW	PNF
<i>Rosa arkansana</i>	wild prairie rose	NI	FAC?	NSH
<i>Rosa multiflora</i>	multiflora rose	UPL, FACU	UPL	IS
<i>Rosa woodsii</i>	Woods' rose	UPL, FAC-	FACU	NS
<i>Rudbeckia hirta</i>	black-eyed susan	FACU-, FACU	FACU	BPNF
<i>Rumex altissimus</i>	pale dock	FAC	FAC, FACW+	PNF
<i>Rumex crispus</i>	curly dock	FACW	FACU, FACW	PIF
<i>Sagittaria brevirostra</i>	shortbeak arrowhead	OBL	OBL	PNEF*
<i>Sagittaria calycina</i>	hooded arrowhead	OBL	OBL	PNEF
<i>Sagittaria cuneata</i>	arumleaf arrowhead	OBL	OBL	PNEF*
<i>Sagittaria graminea</i>	grassy arrowhead	OBL	OBL	PNEF
<i>Sagittaria latifolia</i>	broadleaf arrowhead	OBL	OBL	PNEF*
<i>Sagittaria longiloba</i>	longbarb arrowhead	OBL	OBL	PNEF
<i>Sagittaria rigida</i>	sessilefruit arrowhead	OBL	OBL	PNEF
<i>Salix amygdaloides</i>	peach-leaf willow	FACW	FACW	NT
<i>Salsola kali</i>	Russian thistle	FACU-, FACU+	FACU	AIF
<i>Salvia azurea</i>	blue sage	UPL		PNF
<i>Schedonardus paniculatus</i>	tumblegrass			PNG
<i>Schizachyrium scoparium</i>	little bluestem	FACU	FACU-, FACU+	PNG
<i>Schoenoplectus fluviatilis</i>	river bulrush	OBL	OBL	PNEGL
<i>Schoenoplectus heterochaetus</i>	slender bulrush	OBL	OBL	PNEGL
<i>Schoenoplectus pungens</i>	three-square bulrush	FACW+, OBL	OBL	PNEGL
<i>Scirpus acutus</i>	hard-stem bulrush	OBL	OBL	PNEGL
<i>Scirpus validus</i>	soft-stem bulrush	OBL	OBL	PNEGL
<i>Scutellaria parvula</i>	small skullcap	UPL, FACU	FACU	PNF
<i>Securigera varia</i>	crown-vetch	UPL		PIF
<i>Senecio plattensis</i>	prairie groundsel	UPL, FACU	FACU	BPNF
<i>Setaria pumila</i>	yellow bristle grass	FAC	FACU, FAC	AIG
<i>Setaria verticillata</i>	bristly foxtail	FACU, FAC	FAC	AIG
<i>Setaria viridis</i>	green foxtail	FAC*	NI	AIG
<i>Silene antirrhina</i>	sleepy silene	UPL		ANF
<i>Silphium integrifolium</i>	wholeleaf rosinweed	UPL		PNF
<i>Silphium laciniatum</i>	compassplant	UPL		PNF
<i>Silphium perfoliatum</i>	cup-plant	FACU, FACW	FAC	PNF
<i>Sinapis alba</i>	white mustard	UPL		AIF
<i>Sinapis arvensis</i>	corn mustard			AIF

**Plants**

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<i>Sisyrinchium campestre</i>	blue-eyed grass	UPL		PNF
<i>Sisyrinchium montanum</i>	strict blue-eyed grass	FACU, FACW	FAC	PNF
<i>Solanum carolinense</i>	Carolina nightshade	UPL, FACU	UPL	NSF
<i>Solanum interius</i>	inland nightshade			ANF
<i>Solanum ptycanthum</i>	black nightshade	FAC+*	NI	ANF*
<i>Solanum rostratum</i>	buffalobur nightshade	FAC*	NI	ANF*
<i>Solidago canadensis</i>	Canada goldenrod	FACU	FACU, FACU+	PNF
<i>Solidago gigantea</i>	giant goldenrod	FAC, FACW	FACW	PNF
<i>Solidago graminifolia</i>	flat-top goldenrod	UPL		PNF
<i>Solidago missouriensis</i>	Missouri goldenrod	FACU*	NI	PNF
<i>Solidago rigida</i>	stiff goldenrod	FACU	UPL, FACU	PNF
<i>Sonchus arvensis</i>	field sowthistle	UPL, FAC	FAC	PIF
<i>Sonchus oleraceus</i>	common sowthistle	UPL, FACU	FACU	AIF
<i>Sorghastrum nutans</i>	Indiangrass	FACU	UPL, FACW	PNG
<i>Sorghum bicolor</i>	milo	UPL*	NI	AIG*
<i>Sparganium eurycarpum</i>	giant burreed	OBL	OBL	PNEF
<i>Spartina pectinata</i>	prairie cordgrass	FACW	FACW, OBL	PNG
<i>Sphaeralcea coccinea</i>	false red mallow			BPNFHS
<i>Sphenopholis obtusata</i>	prairie wedgegrass	FAC-, FACW+	FACW	APNG
<i>Spirodela polyrrhiza</i>	greater duckweed	OBL	OBL	PNF
<i>Sporobolus compositus</i> ( <i>asper</i> )	rough dropseed	UPL, FACU	FACU	PNG
<i>Sporobolus cryptandrus</i>	sand dropseed	FACU-	UPL, FACU	PNG
<i>Sporobolus neglectus</i>	poverty grass	FACU	UPL, FACU	ANG
<i>Sporobolus vaginiflorus</i>	poverty dropseed	FACU	UPL, FACU	ANG
<i>Stachys palustris</i>	marsh hedgenettle	FACW, OBL	OBL	PIF
<i>Stipa comata</i>	needle and thread	UPL		PNG
<i>Stipa spartea</i>	porcupine grass	UPL		PNG
<i>Stipa viridula</i>	green needlegrass	UPL		PNG
<i>Strophostyles leiosperma</i>	slickseed fuzzybean			ANFV
<i>Symphoricarpos occidentalis</i>	western snowberry			PNS
<i>Symphoricarpos orbiculatus</i>	coralberry	UPL, FAC-	FACU-	NS
<i>Symphyotrichum divaricatum</i>	annual saltmarsh aster			ABNF
<i>Symphyotrichum ericoides</i>	white heath aster	FACU	UPL, FACU	PNF
<i>Symphyotrichum lanceolatum</i>	panicked aster	FACW	FACW	PNF
<i>Tamarix ramosissima</i>	saltcedar	FAC, FACW	FACW	IT
<i>Taraxacum officinale</i>	common dandelion	FACU	FACU-, FACU+	PIF
<i>Teucrium canadense</i>	American germander	FACW	FAC+, FACW	PNEF
<i>Thalictrum dioicum</i>	early meadow-rue	FACU+, FACW	FAC	PNF
<i>Thinopyrum intermedium</i>	intermediate wheatgrass	UPL		PIG
<i>Thlaspi arvense</i>	field pennycress	FACU?	NI	AIF
<i>Toxicodendron radicans</i>	poison ivy	FACU, FACW	FACU	NWVS
<i>Toxicodendron rydbergii</i>	Rydberg poison ivy	FACU, FACW	FAC	NHS
<i>Tradescantia bracteata</i>	longbract spiderwort	UPL, FAC	FAC	PNF

**Plants**

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<i>Tragopogon dubius</i>	goatsbeard	FACU*	NI	BIF*
<i>Tribulus terrestris</i>	puncturevine	UPL		AIF
<i>Trifolium pratense</i>	red clover	FACU	FACU-, FAC	BPIF
<i>Trifolium repens</i>	white clover	FACU	FACU-, FAC	PIF
<i>Triodanis perfoliata</i>	claspleaf Venus' looking-glass	UPL, FAC	FAC	ANF
<i>Tripsacum dactyloides</i>	eastern gamagrass	FAC, FACW	FAC	PNG
<i>Triticum aestivum</i>	wheat			AIG
<i>Typha angustifolia</i>	narrowleaf cattail	OBL	OBL	PNEF
<i>Typha latifolia</i>	broadleaf cattail	OBL	OBL	PNEF
<i>Typha × glauca</i>	hybrid cattail	OBL	OBL	PNEF
<i>Ulmus americana</i>	American elm	FAC, FACW	FAC	NT
<i>Ulmus pumila</i>	Siberian elm	FACU*	NI	IT*
<i>Utricularia vulgaris</i>	bladderwort	OBL	OBL	PNZF
<i>Verbascum thapsus</i>	common mullein	UPL		PNF
<i>Verbena bracteata</i>	prostrate vervain	FACU	UPL, FACW	APNF
<i>Verbena hastata</i>	blue vervain	FAC, FACW+	FACW	PNF
<i>Verbena urticifolia</i>	white vervain	UPL, FAC+	UPL	APNF
<i>Verbena stricta</i>	hoary vervain	FAC, FACU*	NI	PNF*
<i>Vernonia baldwinii</i>	Baldwin's ironweed	UPL, FACW-	FACW-	PNF
<i>Vernonia fasciculata</i>	prairie ironweed	FAC	FAC, FACW	PNF
<i>Veronica peregrina</i>	purslane speedwell	FACU-, OBL	OBL	ANEF
<i>Vicia americana</i>	American purple vetch	FAC?	NI	PNFV
<i>Viola pedatifida</i>	prairie violet	UPL, FACU	FACU	PNF
<i>Viola pratincola</i>	blue prairie violet	FACU, FAC	FAC-	PNF
<i>Vulpia octoflora</i>	sixweeks-fescue	UPL		ANG
<i>Wolffia columbiana</i>	Columbian watermeal	OBL	OBL	PN/F
<i>Xanthium strumarium</i>	rough cocklebur	FAC	FAC-, FAC+	ANF
<i>Yucca glauca</i>	soapweed	UPL	NI	NT
<i>Zea mays</i>	corn	FAC	NI	AIF

**Mammals**

<i>Scientific Name</i>	<i>Common Name</i>
<i>Blarina brevicauda</i>	northern short-tailed shrew
<i>Blarina brevicauda</i>	short-tailed shrew
<i>Canis latrans</i>	coyote
<i>Castor canadensis</i>	American beaver
<i>Chaetodipus hispidus</i>	hispid pocket mouse
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat
<i>Cryptotis parva</i>	least shrew
<i>Cynomys ludovicianus</i>	black-tailed prairie dog
<i>Didelphis virginiana</i>	Virginia opossum
<i>Dipodomys ordii</i>	Ord's kangaroo rat
<i>Eptesicus fuscus</i>	big brown bat
<i>Geomys bursarius</i>	plains pocket gopher
<i>Lasionycteris noctivagans</i>	silver-haired bat
<i>Lasiurus borealis</i>	eastern red bat
<i>Lasiurus cinereus</i>	hoary bat
<i>Lepus californicus</i>	black-tailed jackrabbit
<i>Lepus townsendii</i>	white-tailed jackrabbit
<i>Lontra canadensis</i>	northern river otter
<i>Lynx rufus</i>	bobcat
<i>Marmota monax</i>	woodchuck
<i>Mephitis mephitis</i>	striped skunk
<i>Microtus ochrogaster</i>	prairie vole
<i>Microtus pennsylvanicus</i>	meadow vole
<i>Microtus pinetorum</i>	woodland vole
<i>Mus musculus</i>	house mouse
<i>Mustela frenata</i>	long-tailed weasel
<i>Mustela nivalis</i>	least weasel
<i>Mustela vison</i>	American mink
<i>Myotis ciliolabrum</i>	western small-footed myotis
<i>Myotis lucifugus</i>	little brown bat
<i>Myotis septentrionalis</i>	northern myotis
<i>Myotis thysanodes</i>	fringed myotis
<i>Myotis volans</i>	long-legged myotis
<i>Nycticeius humeralis</i>	evening bat
<i>Odocoileus hemionus</i>	mule deer
<i>Odocoileus virginianus</i>	white-tailed deer
<i>Ondatra zibethicus</i>	muskrat
<i>Onychomys leucogaster</i>	northern grasshopper mouse
<i>Oryctolagus cuniculus</i>	European rabbit
<i>Perognathus fasciatus</i>	olive-backed pocket mouse
<i>Perognathus flavescens</i>	plains pocket mouse
<i>Perognathus flavus</i>	silky pocket mouse
<i>Peromyscus leucopus</i>	white-footed mouse
<i>Peromyscus maniculatus</i>	deer mouse
<i>Pipistrellus subflavus</i>	eastern pipistrelle

**Mammals**

<i>Scientific Name</i>	<i>Common Name</i>
<i>Procyon lotor</i>	northern raccoon
<i>Rattus norvegicus</i>	Norway rat
<i>Reithrodontomys megalotis</i>	western harvest mouse
<i>Reithrodontomys montanus</i>	plains harvest mouse
<i>Scalopus aquaticus</i>	eastern mole
<i>Sciurus niger</i>	eastern fox squirrel
<i>Sigmodon hispidus</i>	hispid cotton rat
<i>Sorex haydeni</i>	prairie shrew
<i>Sorex merriami</i>	Merriam's shrew
<i>Spermophilus franklinii</i>	Franklin's ground squirrel
<i>Spermophilus tridecemlineatus</i>	thirteen-lined ground squirrel
<i>Spilogale putorius</i>	eastern spotted skunk
<i>Sylvilagus floridanus</i>	eastern cottontail
<i>Synaptomys cooperi</i>	southern bog lemming
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat
<i>Tamias minimus</i>	least chipmunk
<i>Taxidea taxus</i>	American badger
<i>Thomomys talpoides</i>	northern pocket gopher
<i>Uroditellus elegans</i>	Wyoming ground squirrel
<i>Vulpes velox</i>	swift fox
<i>Vulpes vulpes</i>	red fox
<i>Xerospermophilus spilosoma</i>	spotted ground squirrel
<i>Zapus hudsonius</i>	meadow jumping mouse

**Amphibians**

<i>Scientific Name</i>	<i>Common Name</i>
<i>Spea bombirons</i>	plains spadefoot toad
<i>Anaxyrus americanus</i>	American toad
<i>Anaxyrus cognatus</i>	Great Plains toad
<i>Anaxyrus woodhousii</i>	Woodhouse's toad
<i>Acris crepitans</i>	northern cricket frog
<i>Acris blanchardi</i>	Blanchard's cricket frog
<i>Hyla chrysoscelis</i>	Cope's gray treefrog
<i>Pseudacris maculata</i>	Boreal chorus frog
<i>Gastrophryne olivacea</i>	Great Plains narrowmouth toad
<i>Rana blairi</i>	plains leopard frog
<i>Rana catesbeiana</i>	bullfrog
<i>Ambystoma texanum</i>	smallmouth salamander
<i>Ambystoma mavortium</i>	eastern tiger salamander

**Reptiles**

<i>Scientific Name</i>	<i>Common Name</i>
<i>Apalone spinifera</i>	spiny softshell turtle
<i>Chelydra serpentina</i>	common snapping turtle
<i>Chrysemys picta</i>	painted turtle
<i>Kinosternon flavescens</i>	yellow mud turtle
<i>Terrapene ornata</i>	western box turtle
<i>Aspidozelis sexlineatus</i>	six-lined racerunner
<i>Holbrookia maculata</i>	lesser earless lizard
<i>Ophisaurus attenuatus</i>	slender glass lizard
<i>Plestiodon fasciatus</i>	five-lined skink
<i>Plestiodon multivirgatus</i>	many-lined skink
<i>Plestiodon obsoletus</i>	Great Plains skink
<i>Plestiodon septentrionalis</i>	prairie skink
<i>Sceloporus consobrinus</i>	prairie lizard
<i>Coluber constrictor</i>	eastern racer
<i>Crotalus viridis</i>	prairie rattlesnake
<i>Diadophis punctatus</i>	ringneck snake
<i>Heterodon nasicus</i>	western hognose snake
<i>Heterodon platirhinos</i>	eastern hognose snake
<i>Lampropeltis calligaster</i>	prairie kingsnake
<i>Lampropeltis triangulum</i>	milk snake
<i>Liochlorophis vernalis</i>	smooth green snake
<i>Nerodia sipedon</i>	northern water snake
<i>Pituophis catenifer sayi</i>	gopher snake
<i>Storeria dekayi</i>	brown snake
<i>Storeria occipitomaculata</i>	redbelly snake
<i>Tantilla nigriceps</i>	plains black-headed snake
<i>Thamnophis proximus</i>	western ribbon snake
<i>Thamnophis radix</i>	plains garter snake
<i>Thamnophis sirtalis</i>	common garter snake
<i>Tropidoclonion lineatum</i>	lined snake
<i>Nerodia sipedon</i>	northern water snake
<i>Pituophis catenifer sayi</i>	gopher (bull) snake
<i>Regina grahamii</i>	Graham's crayfish snake
<i>Storeria dekayi</i>	brown snake
<i>Storeria occipitomaculata</i>	redbelly snake
<i>Tantilla nigriceps</i>	plains black-headed snake
<i>Thamnophis elegans</i>	western terrestrial garter snake
<i>Thamnophis proximus</i>	western ribbon snake
<i>Thamnophis radix</i>	plains garter snake
<i>Thamnophis sirtalis</i>	common garter snake
<i>Tropidoclonion lineatum</i>	lined snake

**Taxonomic List of Birds That Have Occurred in the Rainwater Basin***(Order follows the A.O.U. Check-list of North American Birds, 7th ed. Sept. 1998)***Birds of the Rainwater Basin Wetland Management District**

After each species name, one space is entered, then the seasonal abundance codes. The letter “m” was used to indicate that the species is not present during a particular season. For example, “American coot *acar*” (abundant in spring, common in summer, abundant in fall, rare in winter) or “California gull *omom*” (occasional in spring, not present in summer or winter, occasional fall).

Nesting species documented in WPAs (waterfowl production areas) are marked with an asterisk (\*) in front of the species name. Species accounts may indicate presence during the nesting season, but may not be marked as nesting. For example, frequent nesters in the area such as northern rough-winged swallow are not marked as nesters because WPAs do not provide preferred nesting habitat. For the most part, cavity nesters are excluded (the red-bellied woodpecker prefers mature, natural woodlands) due to the absence of mature or dying trees that typically provide cavities. The Rainwater Basin WPAs are managed as grassland-playa lake ecosystems. Non-native trees and shrubs have been removed on most WPAs. Due to remaining shelter belts on WPAs, a few woodland nesters are marked as nesting if they are known to use shelter belts.

*Seasonal Abundance Definitions*

Seasons are listed below. Seasonal abundance codes for some species such as shorebirds may be misleading because their fall migration starts in July or August (summer season). For example: “pectoral sandpiper *cccm*” (common in spring, common in summer due to peak migration occurring from mid-August through fall, not present in winter).

<p>A. Seasons:          Spring (March–May)          Summer (June–August)          Fall (September–November)          Winter (December–February)</p>	<p>B. Seasonal Abundance:          a = abundant: occurring in large numbers          c = common: certain to be seen in suitable habitat          u = uncommon: present, but not certain to be seen          o = occasional: seen only a few times during the season          r = rare: seen at intervals of 2–5 years          h = hypothetical: within normal range, but never documented or has been extirpated          x = outside normal range, but has been documented</p>
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*Updated May 4, 2011*

<i>Common Name</i>	<i>Scientific Name</i>	<i>Seasonal Abundance</i>
<b>Swans, Geese, and Ducks</b>		
Black-bellied Whistling-Duck	<i>Dendrocygna autumnalis</i>	xxxm
Bean Goose	<i>Anser fabalis</i>	xmmm
Greater White-fronted Goose	<i>Anser albifrons</i>	arao
Emperor Goose	<i>Chen canagica</i>	xmmm
Snow Goose	<i>Chen caerulescens</i>	aoao
Ross' Goose	<i>Chen rossii</i>	crco
Canada Goose	<i>Branta canadensis</i>	auac
Brant	<i>Branta bernicla</i>	rmrm
Trumpeter Swan	<i>Cygnus buccinator</i>	hxmh
Tundra Swan	<i>Cygnus columbianus</i>	omrm
Wood Duck	<i>Aix sponsa</i>	cucm
Gadwall	<i>Anas strepera</i>	cuco
Eurasian Wigeon	<i>Anas penelope</i>	rmrm
American Wigeon	<i>Anas americana</i>	aoao
American Black Duck	<i>Anas rubripes</i>	rmrr
Mallard	<i>Anas platyrhynchos</i>	acac
Blue-winged Teal	<i>Anas discors</i>	acar
Cinnamon Teal	<i>Anas cyanoptera</i>	uoum
Northern Shoveler	<i>Anas clypeata</i>	acar
Northern Pintail	<i>Anas acuta</i>	auao

<i>Common Name</i>	<i>Scientific Name</i>	<i>Seasonal Abundance</i>
Garganey	<i>Anas querquedula</i>	xmmm
Green-winged Teal	<i>Anas crecca</i>	aoao
Canvasback	<i>Aythya valisineria</i>	umum
Redhead	<i>Aythya americana</i>	cucm
Ring-necked Duck	<i>Aythya collaris</i>	crum
Greater Scaup	<i>Aythya marila</i>	umrm
Lesser Scaup	<i>Aythya affinis</i>	cocm
White-winged Scoter	<i>Melanitta fusca</i>	xmmm
Black Scoter	<i>Melanitta americana</i>	xmmm
Bufflehead	<i>Bucephala albeola</i>	emcm
Common Goldeneye	<i>Bucephala clangula</i>	omum
Barrow's Goldeneye	<i>Bucephala islandica</i>	mmxm
Hooded Merganser	<i>Lophodytes cucullatus</i>	urum
Common Merganser	<i>Mergus merganser</i>	omoo
Ruddy Duck	<i>Oxyura jamaicensis</i>	cucm
<b>Gallinaceous Birds</b>		
Ring-necked Pheasant	<i>Phasianus colchicus</i>	ecce
Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	rhro
Greater Prairie-Chicken	<i>Tympanuchus cupido</i>	oouu
Northern Bobwhite	<i>Colinus virginianus</i>	ecce
Wild Turkey	<i>Meleagris gallopavo</i>	ecce
<b>Loons</b>		
Common Loon	<i>Gavia immer</i>	omrm
<b>Grebes</b>		
Clark's Grebe	<i>Aechmophorus clarkii</i>	xmrm
Western Grebe	<i>Aechmophorus occidentalis</i>	rmrm
Pied-billed Grebe	<i>Podilymbus podiceps</i>	cccm
Horned Grebe	<i>Podiceps auritus</i>	uhrm
Red-necked Grebe	<i>Podiceps grisegena</i>	hmrm
Eared Grebe	<i>Podiceps nigricollis</i>	cocm
<b>Pelicans</b>		
American White Pelican	<i>Pelecanus erythrorhynchos</i>	cocm
<b>Cormorants</b>		
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	cucm
<b>Bitterns, Herons, and Egrets</b>		
American Bittern	<i>Botaurus lentiginosus</i>	ucum
Least Bittern	<i>Ixobrychus exilis</i>	uuum
Great Blue Heron	<i>Ardea herodias</i>	cccr
Great Egret	<i>Ardea alba</i>	omom
Snowy Egret	<i>Egretta thula</i>	uuum
Little Blue Heron	<i>Egretta caerulea</i>	ormm
Tricolored Heron	<i>Egretta tricolor</i>	hrrm
Cattle Egret	<i>Bubulcus ibis</i>	uoum
Green Heron	<i>Butorides virescens</i>	cucm
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	cocm
Yellow-crowned Night-Heron	<i>Nyctanassa violacea</i>	rmrm

<i>Common Name</i>	<i>Scientific Name</i>	<i>Seasonal Abundance</i>
<b>Ibises and Spoonbills</b>		
White Ibis	<i>Eudocimus albus</i>	hxxm
Glossy Ibis	<i>Plegadis falcinellus</i>	xmmm
White-faced Ibis	<i>Plegadis chihi</i>	uurm
Roseate Spoonbill	<i>Ajaja ajaja</i>	mxmm
<b>New World Vultures</b>		
Black Vulture	<i>Coragyps atratus</i>	mxmm
Turkey Vulture	<i>Cathartes aura</i>	cucm
<b>Osprey, Kites, Hawks, and Eagles</b>		
Osprey	<i>Pandion haliaetus</i>	omom
White-tailed Kite	<i>Elanus leucurus</i>	xmxx
Mississippi Kite	<i>Ictinia mississippiensis</i>	xmxx
Bald Eagle	<i>Haliaeetus leucocephalus</i>	emco
Northern Harrier	<i>Circus cyaneus</i>	cucu
Sharp-shinned Hawk	<i>Accipiter striatus</i>	uruu
Cooper's Hawk	<i>Accipiter cooperii</i>	umur
Northern Goshawk	<i>Accipiter gentilis</i>	rmrr
Red-shouldered Hawk	<i>Buteo lineatus</i>	mrrx
Broad-winged Hawk	<i>Buteo platypterus</i>	mxmm
Swainson's Hawk	<i>Buteo swainsoni</i>	cuur
Red-tailed Hawk	<i>Buteo jamaicensis</i>	cucu
Ferruginous Hawk	<i>Buteo regalis</i>	uxuo
Rough-legged Hawk	<i>Buteo lagopus</i>	uhuu
Golden Eagle	<i>Aquila chrysaetos</i>	omoo
<b>Falcons and Caracaras</b>		
American Kestrel	<i>Falco sparverius</i>	cccc
Merlin	<i>Falco columbarius</i>	umuo
Gyrfalcon	<i>Falco rusticolus</i>	mmmr
Peregrine Falcon	<i>Falco peregrinus</i>	omor
Prairie Falcon	<i>Falco mexicanus</i>	omou
<b>Rails</b>		
Yellow Rail	<i>Coturnicops noveboracensis</i>	rmmr
Black Rail	<i>Laterallus jamaicensis</i>	xxmm
King Rail	<i>Rallus elegans</i>	rrmm
Virginia Rail	<i>Rallus limicola</i>	uumm
Sora	<i>Porzana carolina</i>	cccm
Purple Gallinule	<i>Porphyrio martinica</i>	xmmm
Common Moorhen	<i>Gallinula chloropus</i>	uurm
American Coot	<i>Fulica americana</i>	acar
<b>Cranes</b>		
Sandhill Crane	<i>Grus canadensis</i>	crum
Common Crane	<i>Grus grus</i>	xmmm
Whooping Crane	<i>Grus americana</i>	omom
<b>Plovers</b>		
Black-bellied Plover	<i>Pluvialis squatarola</i>	uumm

<i>Common Name</i>	<i>Scientific Name</i>	<i>Seasonal Abundance</i>
American Golden-Plover	<i>Pluvialis dominica</i>	umum
Snowy Plover	<i>Charadrius alexandrinus</i>	rrmm
Semipalmated Plover	<i>Charadrius semipalmatus</i>	umum
Piping Plover	<i>Charadrius melodus</i>	rhrm
Killdeer	<i>Charadrius vociferous</i>	cccm
<b>Stilts and Avocets</b>		
Black-necked Stilt	<i>Himantopus mexicanus</i>	rrrm
American Avocet	<i>Recurvirostra americana</i>	urum
<b>Sandpipers and Phalaropes</b>		
Greater Yellowlegs	<i>Tringa melanoleuca</i>	cocm
Lesser Yellowlegs	<i>Tringa flavipes</i>	euem
Solitary Sandpiper	<i>Tringa solitaria</i>	ccum
Willet	<i>Tringa semipalmata</i>	uoum
Spotted Sandpiper	<i>Actitis macularius</i>	cccm
Upland Sandpiper	<i>Bartramia longicauda</i>	uumm
Eskimo Curlew	<i>Numenius borealis</i>	hmhm
Whimbrel	<i>Numenius phaeopus</i>	omrm
Long-billed Curlew	<i>Numenius americanus</i>	rmmr
Hudsonian Godwit	<i>Limosa haemastica</i>	umxm
Marbled Godwit	<i>Limosa fedoa</i>	umrm
Ruddy Turnstone	<i>Arenaria interpres</i>	rmmr
Red Knot	<i>Calidris canutus</i>	xmrm
Sanderling	<i>Calidris alba</i>	omom
Semipalmated Sandpiper	<i>Calidris pusilla</i>	aucm
Western Sandpiper	<i>Calidris mauri</i>	room
Least Sandpiper	<i>Calidris minutilla</i>	cccm
White-rumped Sandpiper	<i>Calidris fuscicollis</i>	coom
Baird's Sandpiper	<i>Calidris bairdii</i>	acum
Pectoral Sandpiper	<i>Calidris melanotos</i>	cccm
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	mmxm
Dunlin	<i>Calidris alpina</i>	umum
Curlew Sandpiper	<i>Calidris ferruginea</i>	mxmm
Stilt Sandpiper	<i>Calidris himantopus</i>	acem
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	uumm
Ruff	<i>Philomachus pugnax</i>	xm xm
Short-billed Dowitcher	<i>Limnodromus griseus</i>	uurm
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	aucm
Wilson's Snipe	<i>Gallinago delicata</i>	cocm
American Woodcock	<i>Scolopax minor</i>	rmmr
Wilson's Phalarope	<i>Phalaropus tricolor</i>	aocm
Red-necked Phalarope	<i>Phalaropus lobatus</i>	rmmr
Red Phalarope	<i>Phalaropus fulicarius</i>	mxmm
<b>Skuas, Jaegers, Gulls, and Terns</b>		
Laughing Gull	<i>Leucophaeus atricilla</i>	xmmm
Franklin's Gull	<i>Leucophaeus pipixcan</i>	arem

<i>Common Name</i>	<i>Scientific Name</i>	<i>Seasonal Abundance</i>
Bonaparte's Gull	<i>Chroicocephalus philadelphia</i>	rmrmm
Mew Gull	<i>Larus canus</i>	rmmm
Ring-billed Gull	<i>Larus delawarensis</i>	acco
California Gull	<i>Larus californicus</i>	omom
Herring Gull	<i>Larus argentatus</i>	umuu
Common Tern	<i>Sterna hirundo</i>	umum
Forster's Tern	<i>Sterna forsteri</i>	cucm
Least Tern	<i>Sternula antillarum anthalassos</i>	rrrm
Black Tern	<i>Chlidonias niger</i>	acam
<b>Pigeons and Doves</b>		
Rock Pigeon	<i>Columba livia</i>	cccc
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	oooo
White-winged Dove	<i>Zenaida asiatica</i>	mrmm
Mourning Dove	<i>Zenaida macroura</i>	aaaa
Inca Dove	<i>Columbina inca</i>	mmxm
<b>Cuckoos and Anis</b>		
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	oomm
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	uumm
<b>Barn Owls</b>		
Barn Owl	<i>Tyto alba</i>	oooo
<b>Typical Owls</b>		
Eastern Screech-Owl	<i>Megascops asio</i>	uuuu
Great Horned Owl	<i>Bubo virginianus</i>	cucu
Snowy Owl	<i>Bubo scandiacus</i>	mmmx
Burrowing Owl	<i>Athene cunicularia</i>	uumm
Barred Owl	<i>Strix varia</i>	rrrr
Long-eared Owl	<i>Asio otus</i>	oroo
Short-eared Owl	<i>Asio flammeus</i>	uruu
Boreal Owl	<i>Aegolius funereus</i>	mmxm
<b>Nightjars</b>		
Common Nighthawk	<i>Chordeiles minor</i>	cccm
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	mrmm
<b>Swifts</b>		
Chimney Swift	<i>Chaetura pelagica</i>	aacm
<b>Hummingbirds</b>		
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	oomm
Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>	hrmm
Rufous Hummingbird	<i>Selasphorus rufus</i>	mmrm
<b>Kingfishers</b>		
Belted Kingfisher	<i>Megaceryle alcyon</i>	uuur
<b>Woodpeckers</b>		
Lewis' Woodpecker	<i>Melanerpes lewis</i>	rmxm
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	cccc
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	uuuu
Downy Woodpecker	<i>Picoides pubescens</i>	cccc

<i>Common Name</i>	<i>Scientific Name</i>	<i>Seasonal Abundance</i>
Hairy Woodpecker	<i>Picoides villosus</i>	cccr
Northern Flicker	<i>Colaptes auratus</i>	ccce
<b>Tyrant Flycatchers</b>		
Olive-sided Flycatcher	<i>Contopus cooperi</i>	omom
Eastern Wood-Pewee	<i>Contopus virens</i>	oomm
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	rmmr
Acadian Flycatcher	<i>Empidonax virescens</i>	rmmr
Alder Flycatcher	<i>Empidonax alnorum</i>	rmmr
Willow Flycatcher	<i>Empidonax traillii</i>	orom
Least Flycatcher	<i>Empidonax minimus</i>	umum
Hammond's Flycatcher	<i>Empidonax hammondi</i>	mmxm
Eastern Phoebe	<i>Sayornis phoebe</i>	uumm
Say's Phoebe	<i>Sayornis saya</i>	urrr
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	cocm
Western Kingbird	<i>Tyrannus verticalis</i>	cccm
Eastern Kingbird	<i>Tyrannus tyrannus</i>	cccm
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>	rxrm
<b>Shrikes</b>		
Loggerhead Shrike	<i>Lanius ludovicianus</i>	cccc
Northern Shrike	<i>Lanius excubitor</i>	mmuu
<b>Vireos</b>		
White-eyed Vireo	<i>Vireo griseus</i>	rmmm
Bell's Vireo	<i>Vireo bellii</i>	uoum
Yellow-throated Vireo	<i>Vireo flavifrons</i>	rxrm
Warbling Vireo	<i>Vireo gilvus</i>	cuem
Philadelphia Vireo	<i>Vireo philadelphicus</i>	umum
Red-eyed Vireo	<i>Vireo olivaceus</i>	urum
<b>Crows, Jays, and Magpies</b>		
Blue Jay	<i>Cyanocitta cristata</i>	cccc
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	mmmxx
Black-billed Magpie	<i>Pica hudsonia</i>	uuuu
American Crow	<i>Corvus brachyrhynchos</i>	aoac
<b>Larks</b>		
Horned Lark	<i>Eremophila alpestris</i>	acaa
<b>Swallows</b>		
Purple Martin	<i>Progne subis</i>	cuem
Tree Swallow	<i>Tachycineta bicolor</i>	cocm
Violet-green Swallow	<i>Tachycineta thalassina</i>	xmmm
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	cccm
Bank Swallow	<i>Riparia riparia</i>	uumm
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	ccam
Barn Swallow	<i>Hirundo rustica</i>	aaam
<b>Titmice and Chickadees</b>		
Black-capped Chickadee	<i>Poecile atricapillus</i>	cccc
Tufted Titmouse	<i>Baeolophus bicolor</i>	xxxm

<i>Common Name</i>	<i>Scientific Name</i>	<i>Seasonal Abundance</i>
<b>Nuthatches</b>		
Red-breasted Nuthatch	<i>Sitta canadensis</i>	mxmo
White-breasted Nuthatch	<i>Sitta carolinensis</i>	ooou
<b>Creepers</b>		
Brown Creeper	<i>Certhia americana</i>	mooo
<b>Wrens</b>		
Carolina Wren	<i>Thryothorus ludovicianus</i>	roor
Bewick's Wren	<i>Thryomanes bewickii</i>	xmmm
House Wren	<i>Troglodytes aedon</i>	ccem
Winter Wren	<i>Troglodytes troglodytes</i>	rmro
Sedge Wren	<i>Cistothorus platensis</i>	rurm
Marsh Wren	<i>Cistothorus palustris</i>	uuur
<b>Kinglets</b>		
Golden-crowned Kinglet	<i>Regulus satrapa</i>	umur
Ruby-crowned Kinglet	<i>Regulus calendula</i>	omom
<b>Old World Warblers</b>		
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	orom
<b>Thrushes</b>		
Eastern Bluebird	<i>Sialia sialis</i>	cucr
Mountain Bluebird	<i>Sialia currucoides</i>	omor
Townsend's Solitaire	<i>Myadestes townsendi</i>	rmro
Veery	<i>Catharus fuscescens</i>	rmmm
Gray-cheeked Thrush	<i>Catharus minimus</i>	umrm
Swainson's Thrush	<i>Catharus ustulatus</i>	cmum
Hermit Thrush	<i>Catharus guttatus</i>	rmmr
Wood Thrush	<i>Hylocichla mustelina</i>	rmmr
American Robin	<i>Turdus migratorius</i>	acac
<b>Mimic Thrushes</b>		
Gray Catbird	<i>Dumetella carolinensis</i>	uuur
Northern Mockingbird	<i>Mimus polyglottos</i>	uuum
Brown Thrasher	<i>Toxostoma rufum</i>	cccr
<b>Starlings</b>		
European Starling	<i>Sturnus vulgaris</i>	aaac
<b>Wagtails and Pipits</b>		
American (Water) Pipit	<i>Anthus rubescens</i>	cmcr
Sprague's Pipit	<i>Anthus spragueii</i>	omom
<b>Waxwings</b>		
Bohemian Waxwing	<i>Bombycilla garrulus</i>	mmmr
Cedar Waxwing	<i>Bombycilla cedrorum</i>	cucu
<b>Wood Warblers</b>		
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	rmmm
Tennessee Warbler	<i>Vermivora peregrina</i>	cmcm
Orange-crowned Warbler	<i>Vermivora celata</i>	cmcm
Nashville Warbler	<i>Vermivora ruficapilla</i>	umum
Northern Parula	<i>Parula americana</i>	umrm

<i>Common Name</i>	<i>Scientific Name</i>	<i>Seasonal Abundance</i>
Yellow Warbler	<i>Dendroica petechia</i>	cccm
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	umum
Magnolia Warbler	<i>Dendroica magnolia</i>	umum
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	rmrm
Yellow-rumped Warbler	<i>Dendroica coronata</i>	cmcm
Black-throated Gray Warbler	<i>Dendroica virens</i>	xmmm
Black-throated Green Warbler	<i>Dendroica virens</i>	omom
Townsend's Warbler	<i>Dendroica townsendi</i>	rmrm
Blackburnian Warbler	<i>Dendroica fusca</i>	omom
Yellow-throated Warbler	<i>Dendroica dominica</i>	rmrm
Pine Warbler	<i>Dendroica pinus</i>	hmrm
Prairie Warbler	<i>Dendroica discolor</i>	rmrm
Palm Warbler	<i>Dendroica palmarum</i>	omrm
Bay-breasted Warbler	<i>Dendroica castanea</i>	omom
Blackpoll Warbler	<i>Dendroica striata</i>	cmrm
Black-and-white Warbler	<i>Mniotilta varia</i>	cmum
American Redstart	<i>Setophaga ruticilla</i>	coem
Prothonotary Warbler	<i>Protonotaria citrea</i>	rmrm
Ovenbird	<i>Seiurus aurocapilla</i>	umum
Northern Waterthrush	<i>Seiurus noveboracensis</i>	umum
Louisiana Waterthrush	<i>Seiurus motacilla</i>	rmhm
Kentucky Warbler	<i>Oporornis formosus</i>	rmhm
Connecticut Warbler	<i>Oporornis agilis</i>	rmxh
Mourning Warbler	<i>Oporornis philadelphia</i>	rmhm
MacGillivray's Warbler	<i>Oporornis tolmiei</i>	omrm
Common Yellowthroat	<i>Geothlypis trichas</i>	cccm
Hooded Warbler	<i>Wilsonia citrina</i>	rmrm
Wilson's Warbler	<i>Wilsonia pusilla</i>	umum
Canada Warbler	<i>Wilsonia canadensis</i>	rmrm
Yellow-breasted Chat	<i>Icteria virens</i>	oomm
<b>Tanagers</b>		
Summer Tanager	<i>Piranga rubra</i>	rmxm
Scarlet Tanager	<i>Piranga olivacea</i>	omom
<b>Sparrows and Towhees</b>		
Green-tailed Towhee	<i>Pipilo chlorurus</i>	rmrm
Spotted Towhee	<i>Pipilo maculatus</i>	uoum
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	umum
Cassin's Sparrow	<i>Peucaea cassinii</i>	xmmm
American Tree Sparrow	<i>Spizella arborea</i>	aoaa
Chipping Sparrow	<i>Spizella passerina</i>	aoar
Clay-colored Sparrow	<i>Spizella pallida</i>	cher
Brewer's Sparrow	<i>Spizella breweri</i>	rmrm
Field Sparrow	<i>Spizella pusilla</i>	cucl
Vesper Sparrow	<i>Poocetes gramineus</i>	cocx
Lark Sparrow	<i>Chondestes grammacus</i>	cccm

<i>Common Name</i>	<i>Scientific Name</i>	<i>Seasonal Abundance</i>
Lark Bunting	<i>Calamospiza melanocorys</i>	ouom
Savannah Sparrow	<i>Passerculus sandwichensis</i>	cmch
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	cccm
Baird's Sparrow	<i>Ammodramus bairdii</i>	umum
Henslow's Sparrow	<i>Ammodramus henslowii</i>	rrrm
Le Conte's Sparrow	<i>Ammodramus leconteii</i>	umem
Nelson's Sharp-tailed Sparrow	<i>Ammodramus nelsoni</i>	rmum
Fox Sparrow	<i>Passerella iliaca</i>	omor
Song Sparrow	<i>Melospiza melodia</i>	cucu
Lincoln's Sparrow	<i>Melospiza lincolni</i>	crem
Swamp Sparrow	<i>Melospiza georgiana</i>	uoum
White-throated Sparrow	<i>Zonotrichia albicollis</i>	cour
Harris' Sparrow	<i>Zonotrichia querula</i>	coeu
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	cruo
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	rmrm
Dark-eyed Junco	<i>Junco hyemalis</i>	cmca
McCown's Longspur	<i>Rhynchophanes mccownii</i>	rmrm
Lapland Longspur	<i>Calcarius lapponicus</i>	amaa
Smith's Longspur	<i>Calcarius pictus</i>	omur
Chestnut-collared Longspur	<i>Calcarius ornatus</i>	omom
Snow Bunting	<i>Plectrophenax nivalis</i>	rmro
<b>Cardinals, Grosbeaks, and Allies</b>		
Northern Cardinal	<i>Cardinalis cardinalis</i>	cccc
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	uurm
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	crem
Blue Grosbeak	<i>Pheucticus ludovicianus</i>	uumm
Lazuli Bunting	<i>Passerina caerulea</i>	xmxx
Indigo Bunting	<i>Passerina cyanea</i>	uumm
Painted Bunting	<i>Passerina ciris</i>	rmxx
Dickcissel	<i>Spiza americana</i>	caem
<b>Blackbirds and Orioles</b>		
Bobolink	<i>Dolichonyx oryzivorus</i>	ccem
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	acao
Eastern Meadowlark	<i>Sturnella magna</i>	uuuo
Western Meadowlark	<i>Sturnella neglecta</i>	acac
Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	aocr
Rusty Blackbird	<i>Euphagus carolinus</i>	cour
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	cuco
Common Grackle	<i>Quiscalus quiscula</i>	aaaao
Great-tailed Grackle	<i>Quiscalus mexicanus</i>	cccr
Brown-headed Cowbird	<i>Molothrus ater</i>	acar
Orchard Oriole	<i>Icterus spurius</i>	ccem
Baltimore Oriole	<i>Icterus galbula</i>	ccem
Scott's Oriole	<i>Icterus parisorum</i>	mxmm

<i>Common Name</i>	<i>Scientific Name</i>	<i>Seasonal Abundance</i>
<b>Finches</b>		
Pine Grosbeak	<i>Pinicola enucleator</i>	xm xm
Purple Finch	<i>Carpodacus purpureus</i>	umuo
House Finch	<i>Carpodacus mexicanus</i>	cccc
Red Crossbill	<i>Loxia curvirostra</i>	mrmo
Common Redpoll	<i>Acanthis flammea</i>	ormo
Pine Siskin	<i>Spinus pinus</i>	uouu
American Goldfinch	<i>Spinus tristis</i>	cccc
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	rmrr
<b>Old World Sparrows</b>		
House Sparrow	<i>Passer domesticus</i>	aaaa



# Appendix C

## *Environmental Assessment*

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### SECTION 1 — PURPOSE OF AND NEED FOR ACTION

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The Rainwater Basin was once covered by native prairie and was largely isolated from streams and natural drainages. Heavy rains or snow melts would fill the numerous shallow depressions scattered throughout the region. Its geographic location in the mid portion of the central flyway made the Rainwater Basin an oasis of food and rest for millions of birds making their northward migration to their breeding grounds. Waterfowl, shorebirds, and grassland birds would dominate the skies, with raptors following the migration.

Today, the landscape is dramatically changed. The expansive grasslands and numerous wetlands have been replaced with fields of corn and soybeans. Roads traverse the landscape at 1-mile intervals, and small rural communities are scattered within a 10-mile radius of one another. Many of the wetlands have been filled or drained, and their numbers have been reduced to only about 16 percent of their historical level.

The remaining wetlands play an increasingly important role in providing resting and feeding areas for the millions of birds that continue to use the central flyway each spring and fall. However, their function as wetlands has been diminished by sedimentation, nutrient runoff, and reduced water runoff within the watersheds. Waterfowl and shorebirds are forced to crowd into fewer areas and compete for the limited amount of natural food provided by the wetlands.

The proposed Rainwater Basin Expansion Project (Rainwater Basin Wetland Management District Expansion Project) would contribute to the conservation efforts described in such plans as the North American Waterfowl Management Plan, the United States Shorebird Conservation Plan, Partners in Flight, the North American Waterbird Conservation Plan, and the Nebraska Natural Legacy Plan.

24,000 acres of wetland habitat within the Rainwater Basin region. To date, 22,023 acres have been acquired. An additional 4,505 acres have been gifted, primarily from other Federal agencies including the Farmers Home Administration. Although the Service owns and manages these gifted properties, they were not acquired under the authority of the National Wildlife Refuge System and therefore are not considered part of the total acreage.

The Service proposes to strategically acquire an additional 9,177 acres in fee title and 5,000 acres in conservation easements (table 1). All purchases would be from voluntary sellers. These 14,177 acres represent 0.36 percent of the total land area of the Rainwater Basin.

Fee-title acquisition would focus on lands that meet one of two criteria: wetland portions that adjoin properties already partially held in fee title by the Service and larger semipermanent wetlands located within a wetland complex of smaller seasonal wetlands. These properties would be managed as WPAs (waterfowl production areas). Management practices would include prescribed burning, livestock grazing, limited haying, and periodic resting (USFWS 2007). The areas would be open to public recreation, including hunting, wildlife viewing, photography, and environmental interpretation and education.

Conservation easements would be purchased on privately owned property containing smaller wetlands. The easements would protect the wetlands from being drained or filled. Surrounding upland buffer areas under easement would be planted with native grasses and protected from commercial and residential development, although haying and grazing would be allowed.

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### Proposed Action

The Service (U.S. Fish and Wildlife Service) is proposing the Rainwater Basin Expansion Project to expand the number of acres in Nebraska's Rainwater Basin that it can own in fee title or hold in easements. Currently, the Service has been authorized to purchase

**Table 1. Wetland Acquisition Authority within the Rainwater Basin Wetland Management District**

	<i>Prior Authorization Acres*</i>	<i>Additional Acres Approved</i>	<i>New Authorization Acres</i>
Fee	24,000	9,177	33,177
Wetland		6,500	
Upland		2,677	
Easement		5,000	5,000
Wetland		2,500	
Upland		2,500	
			38,177

\* Current authorization does not distinguish between fee-title and easement acquisition

## Project Area

The Rainwater Basin is located near the center of the Great Plains. It encompasses approximately 6,100 square miles, covering portions or all of 21 counties in south-central Nebraska (figure 1) (LaGrange 2005). At its widest, it is 160 miles across, extending from Gosper County to central Seward County. The northern edge parallels the central Platte River, and the southern edge lies about 10 miles north of the Kansas border.

The topography ranges from flat to gently rolling loess plains that historically supported a tallgrass and mixed-grass prairie ecosystem. The area is geologically new and has not developed a complete system of streams to drain surface water. The shallow depressions, formed predominately by wind scouring, are quickly filled with runoff following spring snow melts and heavy rains—thus the name Rainwater Basin. The size of the depressions or wetlands ranges from a few acres to more than 1,000 acres.

The climate is semiarid, with annual precipitation ranging from 21 to 28 inches (west to east). Annual evaporation for small bodies of water averages 46 inches, and about 77 percent of that amount is lost from May through October. Most of the precipitation occurs in the spring and summer. Heavy rains fill the wetlands, but they dry out in a matter of a few weeks. Wind scouring of dry wetland basins has caused the finer silts and loam soils to be removed, while the heavier clays remain in the wetland bottoms. In some wetlands, the impervious clay layer that has formed extends as deep as 72 inches.

The region lies in the center of the central flyway. Migratory birds from the gulf coast states, Mexico, and areas further south funnel through the Rainwater Basin before spreading outward toward the Prairie Pothole Region and areas further north. The flight

pattern of the migration resembles the shape of an hourglass, with the Rainwater Basin and the central Platte River being at the narrowest part (figure 2). Prominent wetland areas to the south include the Playa Lakes of Texas, New Mexico, Oklahoma, and Kansas. To the north is the Prairie Pothole Region. The prominence of the constriction emphasizes the importance of the Rainwater Basin as a resting and feeding stopover for millions of migratory birds.

The nearby Platte River complements the value of the Rainwater Basin. In years when drought or spring snowstorms make the wetlands unavailable, many of the birds move to the river.

The Rainwater Basin lies over the Ogallala aquifer, which provides water for irrigated agriculture, primarily corn and soybeans. Waste grain provides food for migrating waterfowl and cranes.

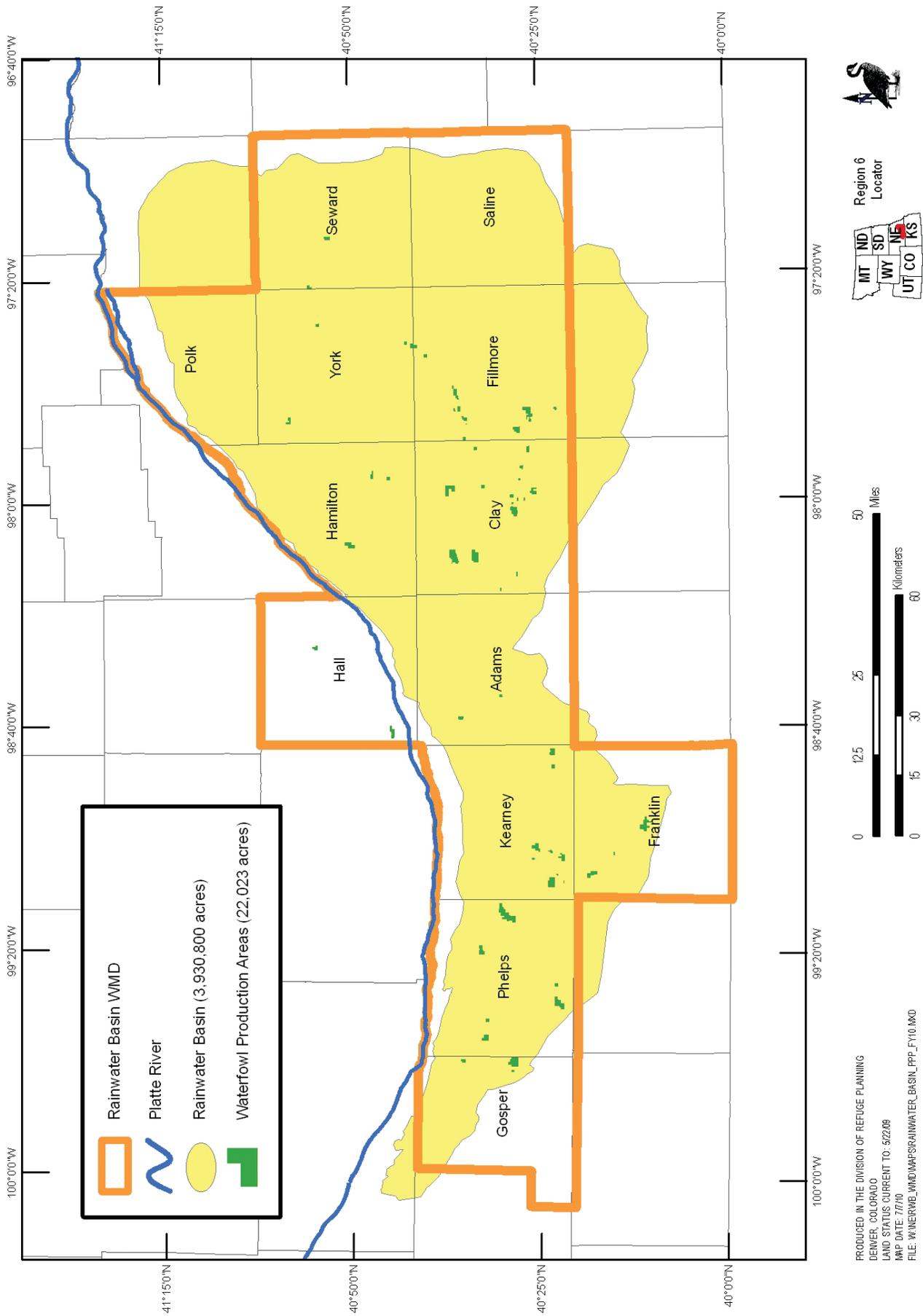
## Purpose of and Need for Proposed Action

Recognizing the importance of the Rainwater Basin as stopover and breeding habitat for millions of migratory birds, the Service began protecting wetlands with fee-title acquisition in 1962. NGPC (Nebraska Game and Parks Commission) took the same approach. All properties were purchased from voluntary sellers.

In most situations, it was the owners of the deeper, wetter portions of the individual wetland basins who were willing to sell. Many surrounding owners of the remaining portion of a wetland chose to retain ownership and farm their portion during drier years. This split ownership greatly reduced the effectiveness of the publicly owned portion of the wetland. This is because if a drained wetland has only a small portion in private ownership, the wetland cannot be effectively restored without purchasing the privately held portion. For example, a 200-acre drained wetland with 180 acres in public ownership and 20 acres in private ownership remains effectively drained until the last 20 acres are purchased. These generally small, privately owned tracts that are connected to publicly owned wetlands are referred to as “roundouts.”

Now, nearly 50 years after the Service began protecting wetlands with fee-title acquisition, only 8.5 percent (18,067 acres) of the historical wetland acres are in public ownership. Public wetland areas (State and Federal) are represented by 90 distinct properties containing all or portions of 168 wetlands, or 1.5 percent of the 11,000 historical wetlands (USFWS, Grand Island GIS Shop, unpublished).

The partners of the Rainwater Basin Joint Venture (see Related Actions and Activities) examined those wetland acres in private ownership that may hamper



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 DENVER, COLORADO  
 LAND STATUS CURRENT TO: 5/22/09  
 IMP DATE: 7/7/10  
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**Figure 1. Rainwater Basin Wetland Management District.**



**Figure 2. Central flyway's spring migration route.**

the ability to manage wetlands owned by the Service or NGPC. The partners also examined the nutritional and energetic needs of all waterfowl while staging in the region. The number of total additional acres needing protection in the Rainwater Basin is based on this collaborative work.

### **FEE TITLE**

Taking into consideration the factors described above, the Rainwater Basin Joint Venture projected that an additional 7,790 wetland acres need to be purchased in fee title by all partners. The Service would strive to acquire 6,500 of these wetland acres. The required upland buffer around these wetlands is estimated to be 2,677 acres. Ownership of properties purchased with the authorization of this proposal would be held by the Service as part of the National Wildlife Refuge System. The properties would be managed as WPAs.

Fee-title acquisition would focus on two types of wetland properties. The primary focus would be on portions of privately owned wetland roundouts that share a boundary with wetlands already owned by the Service. The secondary focus would be on large wetlands that can serve as a core wetland within a complex of smaller, privately owned wetlands.

Currently, 38 WPAs need additional acquisition to complete ownership of the properties' hydric or wetland soil. Adjoining roundout property, which represents a significant portion of the total wetland area, would need to be purchased in fee title to allow full management of the wetland. Adjoining wetland portions that represent a small portion of the wetland and do not significantly impact management on the Service's portion could be protected with conservation easements. Most

properties that could serve as core wetlands within a wetland complex are currently drained and would be more difficult to purchase. Both of these acquisition approaches would have a positive effect on bird use within the local area.

### **CONSERVATION EASEMENTS**

The Joint Venture determined that an additional 9,239 acres of wetlands need to be protected by perpetual easements (Andy Bishop, coordinator, Rainwater Basin Joint Venture, Nebraska; personal communication; May 12, 2010). The Service would strive to acquire 2,500 wetland acres and 2,500 upland buffer acres through conservation easements.

Easements purchased by the Service would be grassland-wetland easements that would require the upland to be in permanent grassland. The easement would restrict commercial and residential development, but would allow the landowner to use the property for haying, grazing, and recreation. Allowing access to the property will remain a landowner's right.

The Rainwater Basin Wetland Management District has administered 31 conservation easements within the region since before 2009. Eight of these easements are within the Rainwater Basin, but only one has significant wetland habitat for migratory birds. Since 2009, the Service has acquired five additional grassland-wetland conservation easements within the Rainwater Basin. Those easements, acquired under the current land acquisition authority, follow the same guidelines proposed in this document.

The NRCS (Natural Resources Conservation Service) is expected to be the dominant partner with the Service in obtaining perpetual easements under its WRP (Wetlands Reserve Program). In 2010, the WRP launched a pilot project that allows landowners to sell a WRP easement, with the buyer retaining the right to graze the property with only minimal restrictions. The reason for allowing grazing is that it helps to keep wetlands in an early successional, seed-producing state, making it more valuable to migrating birds.

### **WATERFOWL NUTRITIONAL NEEDS**

The Rainwater Basin is internationally recognized for its importance as a migration stopover. Birds in migration have additional nutrient demands, not only for the actual migration but to reach a body condition needed for egg production (Devries et al. 2008).

Historically, the Rainwater Basin has provided migrating birds with natural foods from thousands of shallow wetlands. It is impossible to estimate how much food these wetlands provided for waterfowl hundreds of years ago, but recent research into the nutrient value of common native wetland plants documents their high value.

The Rainwater Basin Joint Venture has used data on energetic needs and the number of bird-use days in

the Rainwater Basin to estimate that migratory waterfowl need a total of 15.6 billion Kcal (kilocalories) during their stay in the region from both natural and agricultural sources (Rainwater Basin Joint Venture, unpublished report, 2010).

The conversion of wetlands and grassland to cropland has caused migrating waterfowl to feed heavily on waste grain (top chart in figure 3). Although waste grain meets the caloric requirements of waterfowl, it does not provide the amino acids and minerals required in their diet.

One of the goals of the Rainwater Basin Joint Venture is to increase the amount of available energy for waterfowl from natural, nonagricultural foods to 4.4 billion Kcal, or 28 percent of their diet (Rainwater Basin Joint Venture, unpublished report). A 2004 GIS (geographic information system) assessment of available wetland habitat and food indicated that, given their current number and condition, the region's wetlands are capable of only providing 13.6 percent of the birds' dietary needs (USFWS, Grand Island GIS Shop, unpublished).

In addition to loss of wetlands, remaining wetlands with altered hydrology or no active management for wildlife are more prone to developing dense stands of late-successional plants such as reed canary grass, cattail, and bulrush. Research suggests that wetlands dominated by late-successional plants can provide only about one-tenth of the kilocalories (0.025 million Kcal/acre) of wetlands in an early-successional stage (USDA, NRCS 2008).

The proposed action would contribute to meeting the nutritional needs of migratory birds determined by the Rainwater Basin Joint Venture. Better vegetation management in existing wetlands and an increase in the number of wetlands providing natural foods are required. The bottom chart in figure 3 shows where future wetland foods will come from. Acquisition and management of additional wetlands would increase the projected contribution from public wetlands from 5.8 to 21.3 percent. This action would provide the greatest amount of increased nutrition with the fewest number of acres.

Easement purchases and associated management would need to be increased to provide 10.2 percent of needed calories. Short-term wetlands are those that have less than 99-year easements or land use contracts. These wetlands would be expected to provide almost 5 percent of needed calories. Privately owned wetlands that have no protection would be expected to continue to provide 6 percent of the wetland foods.

## Decisions to Be Made

The Service's planning team (see appendix B) will complete an analysis of the alternatives. Based on the analysis documented in this environmental assessment, the Service's Regional Director of Region 6, with the concurrence of the Director of the U.S. Fish and Wildlife Service, may make two decisions:

- Determine whether the Service should expand the acquisition authority for the Rainwater Basin Wetland Management District; and,
- If yes, determine whether the selected alternative would have a significant impact on the quality of the human environment. The National Environmental Policy Act of 1969 requires this decision. If the quality of the human environment would not be significantly affected, a finding of no significant impact will be signed and made available to the public. If the alternative would have a significant impact or impacts, completion of an environmental impact statement would be required in order to address those impacts.

## Issues Identified and Selected for Analysis

Two public scoping meetings were held in Clay Center and Holdrege, Nebraska, in January 2011. Public comments were taken at these scoping meetings to identify issues to be analyzed for the proposed action. Approximately 33 landowners, citizens, and elected representatives attended the meetings. Additionally, 16 letters providing comments and identifying issues and concerns were received.

The Service's field staff contacted local government officials, other public agencies, and conservation groups that have expressed an interest in and a desire to provide a sustainable future for wetlands in the Rainwater Basin region. Approximately 170 fact sheets were mailed out, and project information was also made available at the Rainwater Basin Wetland Management District and regional planning Web sites.

Many of the comments were related to the biological needs of waterfowl and socioeconomic issues. Comment topics are summarized below.

### BIOLOGICAL ISSUES

- Concern about past and future loss of wetlands within the Rainwater Basin
- Concern about providing adequate habitat for spring migration

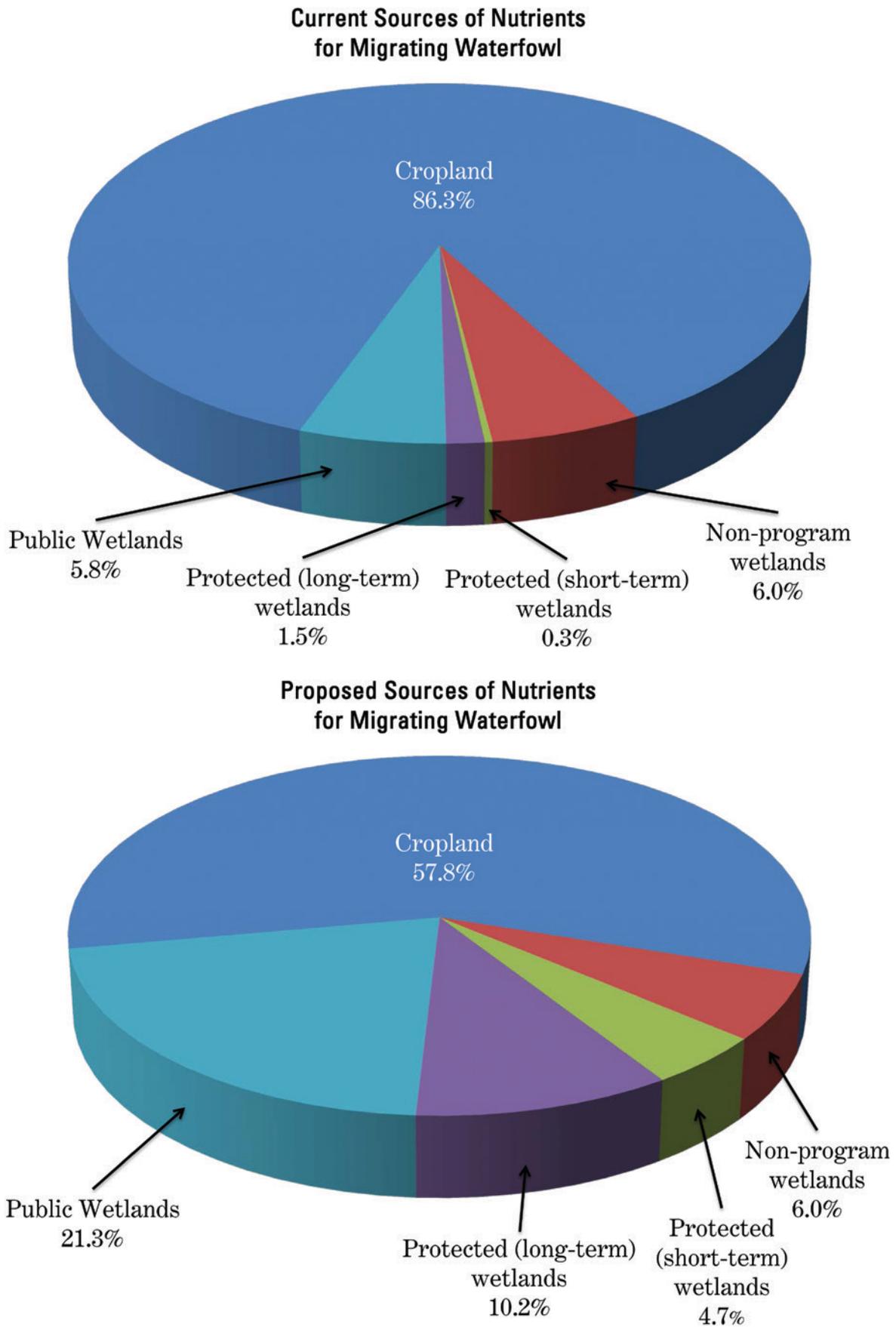


Figure 3. Sources of nutrients for migrating waterfowl.

- Concern about the value of the region for migrating birds and the need to protect declining species
- Concern that farm programs and increased interest in biofuels may cause loss of the remaining unprotected wetlands
- Concern that the energetics model used to determine the number of proposed acquisition acres is not a valid or accurate model
- Concern that wetlands in public ownership are not being managed for the benefit of all wildlife, including pheasants

## SOCIOECONOMIC ISSUES

- Concern that land protection discourages or negatively affects economic activity in the area
- Concern about the loss of taxes paid to the county, and that these lost taxes will place a greater burden on local taxpayers
- Concern that acquisition may drive up land prices
- Concern that transition from privately owned farmland to public ownership will decrease the human population and support for schools, roads, and other services
- Concern that local governments should be given more authority to approve or disapprove land acquisitions and to determine the use of public property
- Concern that funding should be made available to compensate landowners for their privately owned wetlands
- Concern that the Service should work with landowners to enhance wetlands on private property

## Issues Not Selected for Detailed Analysis

At one of the scoping meetings, the accuracy of the energetics models was called into question. No detailed analysis of this issue was performed for this environmental assessment. This model clearly assumes that the data used to estimate the energetic needs of waterfowl within Rainwater Basin came from a large amount of research not specific to this area. For example, the energetic value (Kcal) of a particular wetland plant studied in another part of the country is assumed to have an energetic value similar to that of the same plant species within the Rainwater Basin. The validity of this assumption is currently unknown and would require site-specific research. The energetic value given to plants in the Rainwater Basin, however, represents the best information available. Information from the energetic model has helped the Service better understand the importance of the Rainwater

Basin for migratory waterfowl, not just as a resting area but also as a source of amino acids and minerals.

The issue of land management on WPAs is addressed only in general terms in this document. Land management actions depend on a large number of variables, including existing vegetative conditions, site-specific objectives, past management actions, seasonal weather conditions, and other planned management actions. In addition, the wetland management district in 2007 developed a CCP (comprehensive conservation plan) (USFWS 2007) for Service lands within the Rainwater Basin that outlined and analyzed land management actions.

A common concern expressed by the public pertains to wetland grazing and pheasant habitat. The Rainwater Basin Wetland Management District commonly receives comments that the Service does not do as much as it could to increase pheasant populations. Although pheasants are recognized as part of the diversity provided by WPAs, the pheasant is a State-managed species and not a Service responsibility. The purpose of the wetland management district, as described in the Migratory Bird Hunting and Conservation Stamp Act, is to manage migratory birds.

## National Wildlife Refuge System and Authorities

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Lands acquired under the proposed action would be administered as part of the Refuge System in accordance with the National Wildlife Refuge System Administration Act of 1966 and other relevant legislation, Executive orders, regulations, and policies.

Conservation of additional wildlife habitat in the Rainwater Basin region would also continue to be consistent with the following laws, policies, and management plans:

- Migratory Bird Treaty Act (1918)
- Migratory Bird Conservation Act (1929)
- Migratory Bird Hunting and Conservation Stamp Act (1934)
- U.S. Fish and Wildlife Act (1956)
- Land and Water Conservation Fund Act (1965)
- North American Wetlands Conservation Act (1968)
- Endangered Species Act (1973)

- North American Waterfowl Management Plan (1994)
- National Wildlife Refuge System Biological Integrity, Diversity, and Environmental Health (2001)
- Migratory Non-Game Birds of Management Concern in the U.S. (2002)

## Related Actions and Activities

The Service is working with other public and private entities to maintain wildlife habitat within the Rainwater Basin region. Many organizations in Nebraska have recognized the ecological significance of the region and the need to promote conservation in concert with production agriculture. Wetland acquisition and restoration in the area have been done by the NGPC, NRCS, Ducks Unlimited, and The Nature Conservancy. Local natural resource districts have worked closely with conservation partners to maintain a balance between wetland habitats and agriculture.

In 2007, the wetland management district developed a CCP (Comprehensive Conservation Plan) (USFWS 2007) for Service lands within the Rainwater Basin. The document identifies land management activities planned by the Service through 2022. The need for additional land acquisition was identified as important in the draft CCP sent out for public comment and the subsequent final document.

### RAINWATER BASIN JOINT VENTURE

The Rainwater Basin was identified as a habitat of major concern by the North American Waterfowl Management Plan, establishing it as a focus area for a joint venture (NAWMP 1986). Partners involved in the formation of the joint venture included the Service, the NGPC, Ducks Unlimited, the NRCS, Little Blue Natural Resource District, and the National Audubon Society. Its current partners include many of these same organizations as well as other natural resource districts, The Nature Conservancy, and private landowners.

The Rainwater Basin Joint Venture is currently in the process of rewriting its Implementation Plan (Gersib et al. 1992). The newer version is expected to identify a need to acquire an additional 20,000 acres (about 60 percent of which would be perpetual easements). One proposed strategy is developing working landscapes, which would involve the purchase and restoration of wetlands and grasslands, with the property being resold to the private sector once a conservation easement has been established. The easement would allow livestock grazing and dryland haying, but no farming. The right to allow public access would also remain with the landowner. This approach would

protect wetlands, restore grasslands, and provide agricultural income to the landowners.

### PARTNERS FOR FISH AND WILDLIFE PROGRAM

PFW (Partners for Fish and Wildlife Program) is administered by the Service; it provides financial and technical assistance, and works cooperatively with landowners to voluntarily restore and enhance wildlife habitat on private land. The program was implemented in Nebraska in 1991 and has been growing ever since. Since the early 1990s, approximately 400 projects have been accomplished statewide, resulting in a substantial amount of habitat restored for Federal trust species such as migratory birds and threatened and endangered species. In Nebraska, the predominant wetland restoration and enhancement techniques involve restoring the natural hydrology through the blocking of drains, breaking tiles, filling in concentration pits, removing sediment, installing grass buffers, installing fences along stream corridors, and addressing problems throughout the watershed. Wetland enhancement activities include working with the landowners to better manage the wetland through the use of grazing, haying, disking, and burning. Upland and riparian areas are restored and enhanced through installing cross fencing, providing alternative sources of water, and developing grassland/grazing management plans. Prairie restoration along the central Platte River involves the conversion of cropland to a high-diversity mixture ranging from 100 to 200 species of locally harvested native grasses and forbs.

### DUCKS UNLIMITED

Ducks Unlimited has long recognized the Rainwater Basin as a focus area for wetland conservation efforts. Its goal is to secure a base of wetland complexes to restore the region's function for waterfowl. In 2002, it began acquiring the Verona Complex in the central portion of the Rainwater Basin. Much of the property, including both the wetland and the surrounding upland, has required restoration. Ducks Unlimited's Rainwater Basin initiative uses multiple approaches, consisting of land acquisition, wetland restoration, wetland management, and affecting public policy. The land acquisition portion involves the purchase of land containing existing or restorable wetland habitat. Once Ducks Unlimited has restored the wetlands, the property may be sold to a public agency or to a private buyer with a conservation easement in place. The proceeds from the sale are then used to repeat the process.

### NEBRASKA GAME AND PARKS COMMISSION

NGPC continues to work toward acquisition, restoration, and management of Rainwater Basin wetlands. Currently, it owns approximately 6,700 wetland acres. Its philosophy of acquisition, restoration, and management of its lands mirrors that of the Service.

NGPC also faces the problems of split ownership and is working toward acquiring roundouts to improve the functionality of its wetlands.

NGPC developed the Nebraska Legacy Plan (Schneider et al. 2005), which is Nebraska's "Comprehensive Wildlife Conservation Strategy." Such plans are required by Congress for all States. The plan was developed by a partnership team made up of 20 Federal and State agencies, nongovernmental organizations, and the Ponca Tribe of Nebraska. This document has become the guiding document for conservation groups throughout the State.

The plan identifies the Rainwater Basin as a biologically unique landscape. Key concerns identified for this region include the spread of invasive species, conversion of natural habitats, alteration of grazing and burning regimes, and drainage and sedimentation of existing wetlands.

### **NATURAL RESOURCES CONSERVATION SERVICE**

The NRCS is one of the major partners in wetland conservation in the region. Most of its recent work has been associated with the national Wetlands Reserve Program, a voluntary program to restore wetlands. The program has three options for landowners: permanent conservation easements, 30-year conservation easements, or a simple cost-share restoration agreement. Lands enrolled in a conservation easement have both the wetlands and the surrounding upland restored. Within the Rainwater Basin, Wetlands Reserve Program contracts scattered across the Rainwater Basin Wetland Management District have restored and protected approximately 7,077 acres (Randy Epperson, program manager, Natural Resource Conservation Service, Nebraska; personal communication; 2011).

Recently, the NRCS granted a variance to the Wetlands Reserve Program within Nebraska. The variance will allow the sellers of conservation easements to retain grazing rights. The basis of the variance is that grazing is a critical, natural process in sustaining shallow, playa wetlands.

In addition, because of the intense agriculture and history of wetland drainage within the Rainwater Basin, the Nebraska office of NRCS in 2010 approved an application that requested a variance to allow center pivot irrigation equipment to traverse portions of wetlands and uplands protected under the Wetlands Reserve Program. However, numerous wetlands remain drained and without conservation protection because farmers need to run one or more pivot wheels across a wetland, which is generally not allowed under the Wetlands Reserve Program.

The Farm Service Agency, with technical assistance from the NRCS, administers the CRP (Conservation Reserve Program), which emphasizes support for working livestock-grazing operations, enhancement of plant and animal biodiversity, and protection of

grassland under threat of conversion to other uses for 10 to 15 years. Participants voluntarily limit future development and cropping uses of the land. At the same time, participants retain the right to conduct common livestock-grazing practices and operations related to the production of forage and seeding, subject to certain restrictions during nesting seasons of bird species that are in significant decline or are protected under Federal or State law.

### **NEBRASKA ENVIRONMENTAL TRUST**

By a vote of the people, the Nebraska Environmental Trust was established in 1992 to use 44.5 percent of the State's lottery proceeds for the purpose of conserving, enhancing, and restoring natural physical and biological environments across the State. During its 19-year existence, millions of dollars have been provided toward conservation of wetlands within the Rainwater Basin region. The projects funded by the trust have included fee and easement acquisition, restoration, research, monitoring, and public outreach projects.

### **TRI-BASIN NATURAL RESOURCE DISTRICT**

The Tri-Basin Natural Resource District, located in the western portion of the Rainwater Basin, currently owns and manages a large wetland and two conservation easements that protect privately owned wetlands. In addition, an imposed moratorium on groundwater development has prompted the district to begin exploring ways to reduce groundwater use and to increase groundwater recharge. One such program would be water banking, in which water allocation in one area would be transferred to another area. This type of program leads the way to having drained wetlands restored as marginal farm lands are taken out of irrigation. Other natural resource districts within the Rainwater Basin are also looking at ways to better manage groundwater use for agriculture.

## **Habitat Protection and the Acquisition Process**

Wetland habitat protection would occur through the purchase of fee-title and conservation easements. It is the long-established policy of the Service to acquire minimum interest in land from willing sellers to achieve habitat acquisition goals.

The acquisition authorities for the proposed expansion are the Migratory Bird Hunting and Conservation Stamp Act of 1934, also known as the Duck Stamp Act (16 U.S.C. 718-718h; 48 Stat. 51, as amended); the North American Wetlands Conservation Act (16 U.S.C. Sec. 4401); and the Land and Water Conservation Fund Act of 1965 (P.L. 88-578, Title 16). The Migratory Bird Hunting and Conservation Stamp Act money used to

acquire property is received from Federal Duck Stamp revenue. The North American Wetlands Conservation Act funds are from congressional appropriations, Migratory Bird Treaty Act fines, and various Federal accounts. The Land and Water Conservation Fund is derived primarily from oil and gas leases on the Outer Continental Shelf, motorboat fuel tax revenues, and sale of surplus Federal property.

There could be additional funds to acquire lands, waters, or interest therein for fish and wildlife conservation purposes through congressional appropriations, donations from nonprofit organizations, and other sources.

The basic considerations in acquiring interest in property are the biological significance of a wetland, the feasibility of restoring wetland habitat, and landowner

interest in the program. Fee-title acquisition would focus on two areas: wetland portions that adjoin properties in fee title by the Service, and larger semipermanent wetlands located within a wetland complex of smaller seasonal wetlands. These properties, once acquired, would be managed as WPAs.

Conservation easements would be purchased in perpetuity on privately owned property containing smaller wetlands located in cropland and grassland. The easements would protect the wetlands from being drained or filled. Surrounding upland buffer areas under easement would be planted and remain in grass. All other property rights, including grazing, haying, and public access, would remain with the landowner.

Purchases would occur from willing sellers only and would be subject to available funding.



USFWS

*A waterfowl production area in late spring.*

## SECTION 2 — ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This section describes the two alternatives identified for this project that were developed according to NEPA (National Environmental Policy Act) § 102(2) (E) requirements to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” In addition, alternatives that were eliminated from detailed study are briefly discussed, including the reasons they were not further examined. The following alternatives were analyzed:

- the no-action alternative
- the proposed action, which gives the Service the authority to expand its acquisition authority from its current level of 24,000 acres to 38,177 acres

The alternatives consider the effects of expanding land acquisition within the wetland management district boundary identified in this environmental assessment.

### Alternative A (No Action)

Under alternative A, wetland acquisition would continue until the Service has reached its current authorization of 24,000 acres. After the authorization level has been reached, any additional acres that would come under Service ownership within the Rainwater Basin would come from donations or gifts from landowners, conservation organizations, and other government agencies. Wetland habitat management and restoration would continue on lands owned by the Service to help meet the needs of migratory birds. Refuge revenue sharing payments would continue to be made to counties with Service lands.

Under this alternative, many of the privately owned wetlands that are vulnerable to drainage or other destruction may be lost. The burden to protect wetlands without compensation would lie more heavily on private landowners, and a majority of marginal cropland would not be restored.

### Alternative B (Proposed Action)

Under alternative B, the Service would increase its land acquisition goal from 24,000 acres to 38,177 acres within the Rainwater Basin Wetland Management District. All lands would be acquired from willing

sellers, with acquisition occurring over as many years as necessary to reach the new goal.

The Service would seek to purchase an additional 9,177 acres in fee title and 5,000 acres in conservation easements over the existing goal. Lands targeted for acquisition would be according to a prioritization system established by the Rainwater Basin Joint Venture. This system was developed by biologists from different agencies and organizations to identify and ensure protection of those wetlands that best meet the biological needs of migratory waterfowl and shorebirds.

Within the rating system, fee-title acquisition will meet one of two criteria: privately owned portions of wetlands adjoining existing WPAs and large wetlands that are part of a complex of numerous small wetlands. Conservation easements purchased from willing sellers would focus on small wetlands that are part of a large complex of wetlands.

Lands purchased in fee title would be managed as WPAs and be open to public use.

Conservation easements purchased from willing sellers would prohibit destruction of wetland habitat. In addition, the surrounding upland included in the easement would be required to be maintained as grassland. The landowner would retain access, grazing, and haying rights. Easements would be managed by the Watershed Management District. Monitoring would include periodic reviews of land status through correspondence and meetings with landowners or land managers to ensure that the stipulations of the conservation easement are being met. Photographs would be taken at the time the easements are established in order to document baseline conditions.

Refuge revenue sharing would be paid to counties for Service lands in fee-title ownership. Taxes on lands containing a conservation easement would continue to be paid by the landowner.

### Alternatives Considered but Not Studied

There was no further analysis conducted for the following two alternatives for the reasons described below.

#### WETLAND PROTECTION AND ENHANCEMENT THROUGH PARTNERSHIPS

One alternative that was considered was developing a program similar to CRP that would pay landowners for protecting their wetlands from being altered or

destroyed for a period of 10 years. The contract would be available for renewal every 10 years. This alternative would not ensure the protection of wetlands for the long term. Like CRP lands, wetlands would become vulnerable to drainage when crop prices make it profitable to convert such wetlands to cropland. Furthermore, the Service has an active Partners for Fish and Wildlife Program in the area, which can be used if selling the land is not an option for a landowner.

## **COUNTY ZONING**

In a traditional approach used by counties and municipalities, the local government would use zoning as a means of designating what type of development could occur in an area. Nebraska law grants cities and counties the authority to regulate land use, and engaging in planning and zoning activities is therefore optional. However, zoning may be subject to frequent changes and would not ensure the long-term protection of wetlands.

## SECTION 3 — AFFECTED ENVIRONMENT

### Biological Environment

#### CLIMATE

The region's climate is semiarid, with annual precipitation ranging from 21 to 28 inches (west to east). Annual evaporation for small bodies of water averages 46 inches; about 77 percent of that amount is lost from May through October. Most of the precipitation occurs in the springtime and during summer thunderstorms. Heavy rains fill the wetlands, but quickly dry in a matter of a few weeks. Wind scouring of wetland bottoms has removed the finer silts and loam soils, while the heavier silt clays remain in the wetland bottoms. In some wetlands, the impervious clay layer that has formed extends as deep as 72 inches.

#### CLIMATE CHANGE

Current climate change projections for the Great Plains are for warmer temperatures and increased precipitation. The increase in precipitation is expected to be quite variable across the Great Plains, but will be less than what is needed to offset the increase in temperatures. The result will likely be warmer, drought-like conditions. Intense precipitation events are projected to increase, causing more runoff, pollution, and soil erosion problems. Droughts and floods are expected to occur more frequently. The problems caused by climate change will be further compounded by invasive species that will be able to adapt quickly to fluctuating extreme water conditions.

#### ADAPTATION, MITIGATION, AND ENGAGEMENT

The Service's strategic response to climate change involves three core strategies: adaptation, mitigation, and engagement (USFWS 2009). Through adaptation, the impacts of climate change on wildlife can be reduced by conserving habitats that are expected to be resilient. The Rainwater Basin Expansion Project would provide an anticipatory, rather than a reactive, response. As preserving migratory corridors becomes increasingly important, the Rainwater Basin will continue to provide a stopover area for shorebirds and waterfowl within the central flyway.

Under the expected changes in climate, waterfowl use of the area may increase significantly because most precipitation occurs in early spring and because precipitation events are expected to be more intense in the future. Another factor that may play a significant role in bird use will be the anticipated decline in precipitation and wetlands in other portions of the country.

Carbon sequestration forms one of the key elements of mitigation. The Rainwater Basin Expansion Project

would have a mitigating effect on climate change by capturing carbon. Wetlands that are currently drained and being farmed at the time of purchase would be restored to wetland habitat. Surrounding upland buffer areas would be restored to native warm-season grasses and forbs. Prairie vegetation stores carbon in its deep fibrous roots, with approximately 80 percent of the plant biomass located below ground. Since the land would no longer be farmed, a large amount of carbon is expected to be sequestered.

Engagement involves cooperation, communication, and partnerships to address the conservation challenges presented by climate change (USFWS 2009). The Rainwater Basin Expansion Project would serve as a model for engagement by working with farmers and landowners; nongovernmental organizations such as The Nature Conservancy, Ducks Unlimited, and Pheasants Forever; State and local agencies such as the NGPC and local natural resource districts; and Federal agencies including the NRCS.

#### GEOLOGIC RESOURCES

The Rainwater Basin lies in the flat to gently rolling, mixed-grass, loess plains of south-central Nebraska. This area is geologically new and has not developed a complete system of streams to drain surface water. It is from this characteristic that the area received its name: Rainwater Basin.

Wind-deposited Peorian Loess occurs extensively across the basin and has been stable for about 10,000 years (Keech and Dreezen 1959). Upland soils that formed in wind-deposited material include Crete, Hastings, Holdrege, Hord, and Uly (Kuzila 1984). The soils are suitable for farming, with about 80 percent of the land being planted with crops. The shallow, flat depressions formed predominantly by wind scouring are often referred to as playa wetlands because of their formation process and ephemeral (water levels lasting for a brief time) nature. Radiocarbon dating indicates that the wetlands were created near the end of the ice age, 20,000 to 25,000 years ago. Some depressions may have been enlarged and new ones created as recently as 3,000 years ago (Farrar 1996). Over thousands of years, minute clay particles accumulated in the bottoms of the depressions, allowing water to pond above the soil surface. The impervious clay layers are 6 to 72 inches thick. The wetland soils are predominantly Butler, Fillmore, Scott, and Massie (Kuzila and Lewis 1993, Kuzila 1994).

## HABITAT

### History of Land Development

In contrast to the thick clay in the depressions, the upland soils are very productive silts and loams used for agriculture. At the end of the 1800s, the rich soil was being cultivated, and by the 1910s, larger wetlands were being converted to cropland. In the 1950s, irrigation canals and large-volume wells expanded gravity-flow irrigation, causing smaller wetlands to be filled and their watersheds to be reshaped.

Water concentration pits were constructed to collect irrigation runoff at the lowest parts of the fields in areas that would normally be wetlands. The pits were an effective way to both drain a wetland and gain excavated material to fill the remaining portion of the wetland. The use of concentration pits was extensive. The Service identified 11,859 concentration pits totaling 7,506 acres within the Rainwater Basin in 2004 (USFWS, Grand Island GIS Shop, unpublished). Their water storage capacity is estimated to be about two-thirds of the region's historical wetland storage capacity.

A 1984 (Schildman and Hurt 1984) wetland survey estimated that approximately 4,000 wetlands once existed that covered over 100,000 acres. More recent soil surveys, however, estimate that the original number of wetlands was much higher and covered about twice that number of acres.

In the early 1970s, the loss of wetlands further increased with the development of center pivot irrigation technology. Pasture ground containing wetlands was broken up, drained, and combined with other cropland to form large (160-acre) fields that would support center pivots. The 2004 assessment estimated that only 16 percent (1,693) of the historical wetlands retained some wetland function. Those wetlands total about 38,500 acres.

Many of the former wetlands were intentionally leveled or have been filled with culturally accelerated sediment. Nearly all the remaining wetlands have been affected by surrounding land use. The greatest effect has been the reduction of the watershed's ability to provide enough water to allow the wetlands to function naturally. As more upland has been converted to cropland, sedimentation caused by runoff has increased. In the last 40 years, the use of chemicals and fertilizers in crop production has brought pesticides and high levels of nutrients into the wetlands.

Wetlands in larger watersheds used to retain water on a semipermanent basis. Now with the reshaping of the landscape, creation of roads and ditches, sedimentation, and cultivation practices, even unaltered wetlands cannot function properly and most of them have become more ephemeral.

The loss of pastureland not only affected water quality from runoff, it effectively reduced livestock

available for grazing remaining wetlands. Wetlands that once supported livestock grazing and remained open for waterfowl became choked with cattail and bulrush.

### Past Wetland Protection and Land Use within Watersheds

Many of the problems that are affecting the wetlands go beyond what is actually happening within each wetland to the surrounding land uses. These problems include intense cultivation, land leveling, large livestock confinement areas, and lack of grazing livestock.

Cultivation of upland areas increases soil erosion and sedimentation of wetlands, a process that has been going on in some areas for more than 150 years. Runoff and erosion also transport pesticides and excessive levels of nutrients to the wetlands. In some larger watersheds, seasonal heavy rains are known to occur with enough intensity that residual cornstalks are transported to ditches and waterways. Restoration work on these wetlands often includes sediment removal, especially near the fluvial area of waterways.

Land leveling, as discussed earlier, began with the conversion from dryland farming to gravity flow irrigation. Effective gravity-flow irrigation requires a uniform, gentle slope across the field to allow water released on the upper end of the field to flow gently down toward the lower end. Any wetland or depression in the middle of the field that pooled water was filled. The common practice was to dig large water concentration pits to collect any water that reached the lower end of the field. Soil material removed from the pit was used to fill the remaining portion of the wetland to allow more area to be farmed. The result of this practice was that only the larger wetlands that could not be economically filled or drained remained as wetlands.

Both economic conditions and the availability of cheap corn for feed encouraged large livestock confinement facilities. Many of these were built on poorer, steeper land—often in close proximity to a wetland. Although State regulations control most of the contaminant concerns, large runoff events and operator violations sometimes place these contaminants in wetlands.

The ability of many of the remaining wetlands to function has deteriorated. Sedimentation has resulted in reduced water depth, loss of portions of the watershed's runoff has shifted wetlands toward more seasonal water retention, aquatic vegetation has increased, and, with the absence of grazing livestock, the wetlands have become choked with monotypic stands of cattail, bulrush, and reed canarygrass.

Wetland drainage and conversion is the main threat to the Rainwater Basin wetlands. Over the past decade, wetland loss from drainage and filling has been extensive. Wetland drainage was widespread even

before efforts were made to determine the number of wetlands that existed in the region.

Estimates of the number of historical wetlands are based primarily on soils maps, which show the extent of hydric soils on the landscape. That estimate is 11,000 historical wetlands totaling 204,000 acres (USFWS, Grand Island GIS Shop, unpublished). GIS analysis and high-resolution aerial photography allow for an accurate measure of wetland acres. Current estimates are that 38,500 acres of wetlands remain. The number of functional wetlands has declined to 1,693 (2004 data, USFWS, Grand Island GIS Shop, unpublished). This is about 16 percent of the historical number.

Each year, the slow degradation of wetlands continues. Shallow depressions that are being farmed are slowly filling with sediment from the adjacent upland. Years of farming and pesticide application have adversely affected native vegetation and invertebrates. Farming practices such as no-till farming reduce the amount of soil erosion, but may also reduce the amount of water runoff reaching the depression.

Most of the larger wetlands have been fully or partially drained. Those that have retained some functionality are slowly being subjected to the same forces as the smaller depressions: sedimentation, agricultural chemical runoff, and decreased surface water running into the wetland. Years of no farming or grazing encourages invasion by reed canarygrass, cattail, bulrush, and trees. In general, lack of grazing, burning, and disturbance greatly reduces the value of the wetland for migratory birds. Wetlands that retain a higher level of functionality still capture enough of the watershed's runoff to provide aquatic vegetation, invertebrates, and water for migrating birds, but these remaining wetlands are being subjected to the same adverse effects as the more disturbed wetlands.

An additional threat to some of the wetlands is nutrient and waste runoff from large livestock confinement areas. Animal waste in feedlots is hauled to surrounding fields. Although State regulations are in place to control runoff, heavy rain events can cause rapid runoff carrying waste and chemicals that reach wetlands. Since the wetlands are within a closed drainage, the nutrients and pollutants are not flushed out but accumulate within the wetlands.

There are many factors driving the continued conversion of wetlands within the Rainwater Basin. The assumption is that the wetlands that were easy and economically feasible to drain have already been drained and converted. Each year, however, additional wetlands are lost. Some of the common causes for the continuing loss of wetlands are changes in Farm Bill regulations, commodity prices, increased crop insurance subsidies, and new irrigation and farming technologies. Commodity prices and crop insurance serve as a safety net for farming the more risky lands. New irrigation technologies allow for chemigation, control

of water delivery, and easier access across wet areas and steeper slopes. No-till farming allows for more economical farming in more arid areas than were possible in years past. In recent years, impending moratoriums on groundwater development have stimulated developers and producers to convert more land to cropland.

Property taxes, low livestock prices, and low production rates from dryland farming cause landowners to continually look for ways to make every acre financially productive, reducing the incentive to keep a privately owned wetland.

The conversion of wetlands and grassland has also caused birds to concentrate into fewer areas, increasing the risk of disease outbreaks and competition for natural foods. Waste grain has replaced much of the natural foods in waterfowl diets. Although corn meets the caloric requirements, it is deficient in many of the nutrients found in natural foods (Baldassare and Bolen 1994, Krapu et al. 2004).

### Current Protection Status

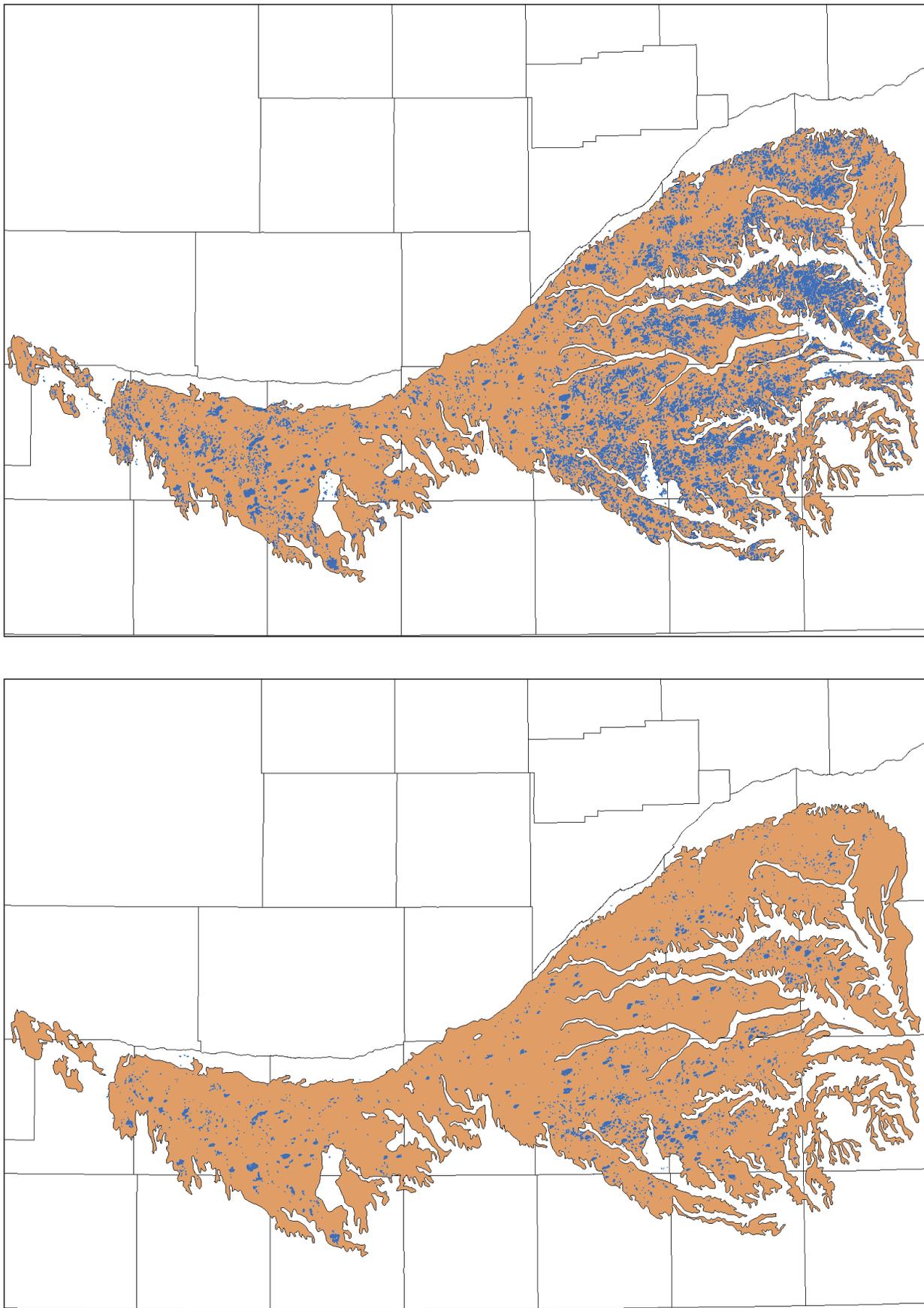
Service acquisition has focused on purchase and protection of the larger wetlands. Over the decades, as the smaller surrounding wetlands have been lost, the wetlands purchased by the Service have become isolated. In some portions of the Rainwater Basin, acquisition needs to focus on protecting the smaller wetlands that make up a complex, while in other portions, a larger core wetland needs to be restored to create a complex. Figure 4 shows the change in spatial distribution of wetlands throughout the region (USFWS, Grand Island GIS Shop, unpublished).

From 2000 to 2008, aerial surveys were conducted every spring by the station biologist to document the amount of migratory bird habitat available. A total of 17,984 acres of public wetlands was surveyed. Of that total, the average amount of suitable habitat (described as any habitat containing water) was 5,582 acres. This means that an average of 32 percent of the public wetland acres was suitable migration habitat. Some of those wetlands were supplemented with groundwater pumped by the Rainwater Basin Wetland Management District and the NGPC.

### Groundwater

Most of the groundwater in the Rainwater Basin area has little or no influence on maintaining wetland water levels. The majority of the groundwater is located more than 50 feet underground, and in some areas the groundwater is more than 400 feet deep. One area east of the Tri-County canal has groundwater levels that are less than 50 feet deep due to artificial groundwater mounds that have developed near the surface (Ekstein and Hygnstrom 1996).

The development of center pivot irrigation in the last third of a century has placed a great demand on the groundwater underlying Rainwater Basin. Irrigation, compounded by extensive drought, has caused



**Figure 4. Historical (top) and current (bottom) wetland distribution and abundance (blue area) within the Rainwater Basin.**

the State legislature to pass legislation to help control groundwater declines. Only the extreme western edge of the Rainwater Basin Wetland Management District lies within an over-appropriated natural resource district. Some of the natural resource districts located within the Rainwater Basin, however, have placed a moratorium on new wells and are requiring stricter monitoring of pumping.

There is some groundwater recharge below Rainwater Basin wetlands. Percolation occurs as macropore flow through desiccation cracks that form during dry conditions (Wilson 2010). However, soil percolation decreases as clays expand and fill the desiccation cracks (Wood 2000, Wilson 2010). Research from playa lakes in Texas and New Mexico has shown similar recharge characteristics (Wood 2000).

Artificially pumping groundwater into the wetlands has made a dramatic difference in amount of habitat on WPAs. The average suitable habitat for WPA wetlands not pumped was 22 percent of the total wetland acres. For WPA wetlands pumped, the average suitable habitat was 39 percent of the total wetland acres.

## WILDLIFE

Rainwater Basin serves as a critical resting and feeding stopover area for millions of waterfowl during spring migration. It is estimated that waterfowl using the area each spring include 7.5 million ducks and 2.1 million geese. Gersib et al. (1989) documented that 50 percent of the mid-continent mallards and 30 percent of the continental northern pintails migrate through during spring migration. Nearly 90 percent of the mid-continent population of greater white-fronted geese has been documented to use this region during their spring migration.

A total of 329 species of birds have been observed within the Rainwater Basin, including 41 species of shorebirds and 35 species of waterfowl. Between 200,000 and 300,000 shorebirds migrate through in the spring. Common grassland species include northern harrier, northern bobwhite, ring-necked pheasant, greater prairie-chicken, dickcissel, western meadowlark, bobolink, field sparrow, and grasshopper sparrow.

Spring migration usually starts with a buildup of Canada geese on the Platte River until the Rainwater Basin wetlands begin to thaw. Snow geese, greater white-fronted geese, and mallards begin to peak by mid- to late February. In early March, northern pintail numbers peak, followed by Ross's geese and green-winged teal. The remaining divers and puddle ducks usually peak during mid- to late March.

Most shorebirds pass through between April 15 and May 15. According to Jorgensen (2004), the most common spring shorebird migrants are black-bellied plover, American golden-plover, semipalmated plover, greater yellowlegs, lesser yellowlegs, willet, upland sandpiper, Hudsonian godwit, dunlin, white-rumped

sandpiper, Baird's sandpiper, semipalmated sandpiper, least sandpiper, stilt sandpiper, short-billed dowitcher, long-billed dowitcher, buff-breasted sandpiper, Wilson's snipe, and Wilson's phalarope. Rainwater Basin has the largest known concentration of buff-breasted sandpipers during spring migration (Jorgensen 2007). Common late-summer migrants are greater and lesser yellowlegs, solitary sandpiper, upland sandpiper, pectoral sandpiper, semipalmated sandpiper, least sandpiper, stilt sandpiper, long-billed dowitcher, and Wilson's snipe.

Rainwater Basin is identified as a landscape of hemispheric importance by the Western Hemisphere Shorebird Reserve Network. It also lies within the Geographic Framework of Bird Conservation Region #19.

Peregrine falcons frequent wetlands during peak shorebird migration periods. Prairie falcons, on the other hand, are most numerous in late winter when horned larks and meadowlarks are common. Merlin are primarily winter visitors and spring migrants (Johnsgard 1997). Bald eagles are most common during peak waterfowl migration. Burrowing owls nest on isolated prairie dog towns.

## Threatened and Endangered Species

Three species listed under the Federal Endangered Species Act and the Nebraska Nongame and Endangered Species Conservation Act use the Rainwater Basin wetlands during migration: the State and Federally endangered whooping crane and least tern, and the State and Federally threatened piping plover.

Forty-two percent of confirmed whooping crane observations in Nebraska have been at Rainwater Basin wetlands (Richert 1999). Most of these sightings occur during the first 2 weeks of April or from late October through mid-November. Piping plovers are rarely seen on Rainwater Basin wetlands due to their size and the number of other shorebirds that would be using mudflat habitats in late April through mid-May (Johnsgard 1997). Least terns have been documented at some wetlands, although their occurrence in the Rainwater Basin is rare.

Other species that are proposed or are candidates for listing under the State and Federal Endangered Species Acts or are species of concern that use the Rainwater Basin include northern harrier, Swainson's hawk, ferruginous hawk, long-billed curlew, black tern, short-eared owl, and Sprague's pipit.

## Mammals

Large mammals common to the region are those associated with grasslands of the Great Plains. They include white-tailed deer, coyote, raccoon, striped skunk, eastern cottontail, American badger, and Virginia opossum. Mule deer have occasionally been seen in the western portion. Muskrat and mink may occur during wetter years but their populations have dropped dramatically with changes in land use and wetlands.

Isolated prairie dog towns are scattered throughout the region, with most of them smaller than 40 acres and located on public lands. Common small mammals include thirteen-lined ground squirrel, northern and plains pocket gopher, Ord's kangaroo rat, meadow jumping mouse, meadow vole, northern grasshopper mouse, and white-footed mouse. Less common mammals are red fox, black-tailed jackrabbit, woodchuck, Franklin's ground squirrel, and eastern fox squirrel.

### **Reptiles and Amphibians**

Semipermanent wetlands provide habitat for painted and snapping turtles. Ornate box turtles may be found in grassland areas. Western garter snakes, bull snakes, and eastern yellowbelly racers are fairly common. Western hog-nosed snakes are less common and prefer dry sandy prairies. Smooth green snake and redbelly snake are rare in the region. The lesser earless lizard may occur in open sandy soil with sparse vegetation, while the six-lined racerunner can be found in both lowland and upland sites.

Amphibians that occur in the Rainwater Basin include plains spadefoot toad, Woodhouse's toad, Great Plains toad, Blanchard's cricket frog, boreal chorus frog, bullfrog, gray treefrog, plains leopard frog, and tiger salamander.

### **Fisheries**

Due to the hydrologic nature of the wetlands within the Rainwater Basin, there currently are no viable fisheries. Two native Missouri River basin cyprinids, the shoal chub and plains minnow, are of concern but have no legal protected status in Nebraska. Catfishes, sunfishes, darters, catostomids, and other minnows are part of the fish communities in this region that are also of concern and of interest to the National Fish Habitat Action Plan partnerships.

## **Cultural Resources**

Archaeological and Native dwelling remains representing 12,000 years of human occupation have been found in the Rainwater Basin. Although there have been few formal investigations done in the area, evidence from the earliest paleo-Indian occupation through the rural and agricultural development of the early 20th century has been located in a variety of geographical settings. Although these sites exhibit a wide range of artifacts and features, definite trends in site types and changes through time are apparent.

Current archaeological evidence indicates that the earliest humans, called paleo-Indians, migrated to the region near the close of the ice age approximately 12,000 years ago. These people had a highly mobile lifestyle that depended on the hunting of big game, including mammoths and a species of huge, now-extinct

bison. The hallmark of most paleo-Indian sites are the beautiful but deadly spear points that are generally recovered from animal kill and butchering sites and small temporary camps. Three late paleo-Indian sites in Frontier County, just to the west of the Rainwater Basin, date from 10,000 to 8,000 years ago and have provided the best evidence of actual living areas. Another well-known paleo-Indian site, the Meserve site, dating to approximately 9,400 years ago, is located in Hall County within the Rainwater Basin.

There was a gradual but definite shift in the pattern of human use of the area beginning about 8,000 years ago. The changes were due to a combination of climatic fluctuations and an increasing population, coupled with tremendous social change and technological innovation. This stage is referred to as the Archaic stage and it lasted until about 1,500 years ago. Although the Archaic stage is better represented in the archaeological record than the preceding paleo-Indian stage, interpretation of the remains is difficult. Evidence of a greater diversity of tools and increased use of native plants is found on many sites, but the remains also suggest a more localized and less mobile population.

By 2,000 years ago, the populations of the area became increasingly influenced by the woodland cultures to the east. This period, referred to as the Plains Woodland period (2,000 to 1,000 years ago), brought great changes and innovation, including the advent of pottery, the bow and arrow, and semipermanent dwellings. Small villages began to be established, and evidence of early agriculture has been found along some of the waterways.

Evidence of an increasingly sedentary population from approximately 1,000 years ago until approximately 400 years ago is found at many of the sites. This adaptation is referred to as the Central Plains village tradition and amplifies many of the trends began during the Plains Woodland period. Small villages of earthen structures with associated agricultural fields became more common. The increased use of pottery in conjunction with the construction of food storage pits reflect a population that was spending increasing amounts of time in one location.

Early postcontact occupation of the area (400 to 100 years ago) included the Pawnee with the Arikara, Arapaho, Cheyenne, Lakota, Oto, and Kansas peoples. Their settlements tended to be large villages with extensive agricultural fields and were often located along the major waterways. Bison hunting, fishing, and Euro-American trade were also primary components of the economy. Beginning in the early 1700s, Euro-American explorers began to make incursions into the area and by the mid-1800s, there was a regular stream of emigrants passing through on the way west. Many of these travelers chose to stay and settle in the area referred to today as the Rainwater Basin.

# Socioeconomic Environment

## LANDOWNERSHIP

The project area includes all or portions of 13 counties: Adams, Clay, Fillmore, Franklin, Gosper, Hall, Hamilton, Kearney, Phelps, Polk, Saline, Seward, and York. The total population of these counties is almost 182,000 people, or roughly 10 percent of Nebraska's population (U.S. Census Bureau 2010). Numerous small communities of less than 1,000 people exist throughout the area. The five largest commercial hubs are Grand Island, Hastings, York, Holdrege, and Minden. The city of Kearney lies outside the Rainwater Basin immediately north of Kearney County.

The population trend within the Rainwater Basin follows the trends seen throughout the State. From 1980 to 2002, the number of farms in the Rainwater Basin region dropped from 4,585 to 3,280, representing a 28.5 percent decline, with the farms becoming larger (Nebraska Agricultural Statistics Service 2003). Between 2002 and 2007, the number of farms within the 13 Rainwater Basin Wetland Management District counties dropped by 6.3 percent, and the average farm size increased by 195 acres (USDA 2007).

During the years 2000 to 2010, the collective population of the counties in the Rainwater Basin increased by 1.0 percent (U.S. Census Bureau 2010). The increase, however, was not uniform. Counties without

a large commercial hub (9 of the 13 counties) showed significant declines. Fillmore and Franklin Counties each experienced about an 11 and 10 percent decline, respectively. Hall County, containing the city of Grand Island, showed nearly all of the gain (figure 5).

The well-being and stability of the small communities have depended on the farming economy, primarily irrigated corn and soybeans. As land becomes more concentrated in larger farm operations, fewer families remain in small communities to support businesses, schools, and churches. The trend is for people to move to larger nearby commercial hubs.

Approximately 1.6 percent of land in Nebraska is in either State or Federal ownership (U.S. Census Bureau, 1991). Only Iowa and Kansas have less government ownership by percentage. Within the Rainwater Basin, agriculture (79.9 percent cropland and 10.5 pasture or CRP) is the dominant land use (US-FWS, Grand Island GIS Shop, unpublished). Roads or communities make up 5.4 percent of the land area. Fish and Wildlife Service lands within the region total 23,855 acres, representing about 0.6 percent of the region. Clay County, with the U.S. Department of Agriculture's 35,000-acre Roman L. Hruska Meat Animal Research Center, has a higher percentage of Federal ownership than the other Rainwater Basin counties. Located west of Clay Center, Nebraska, the research center is the largest Federally owned property in the project area. Nonfarmed wetlands represent 1 percent of the land use. See the Habitat

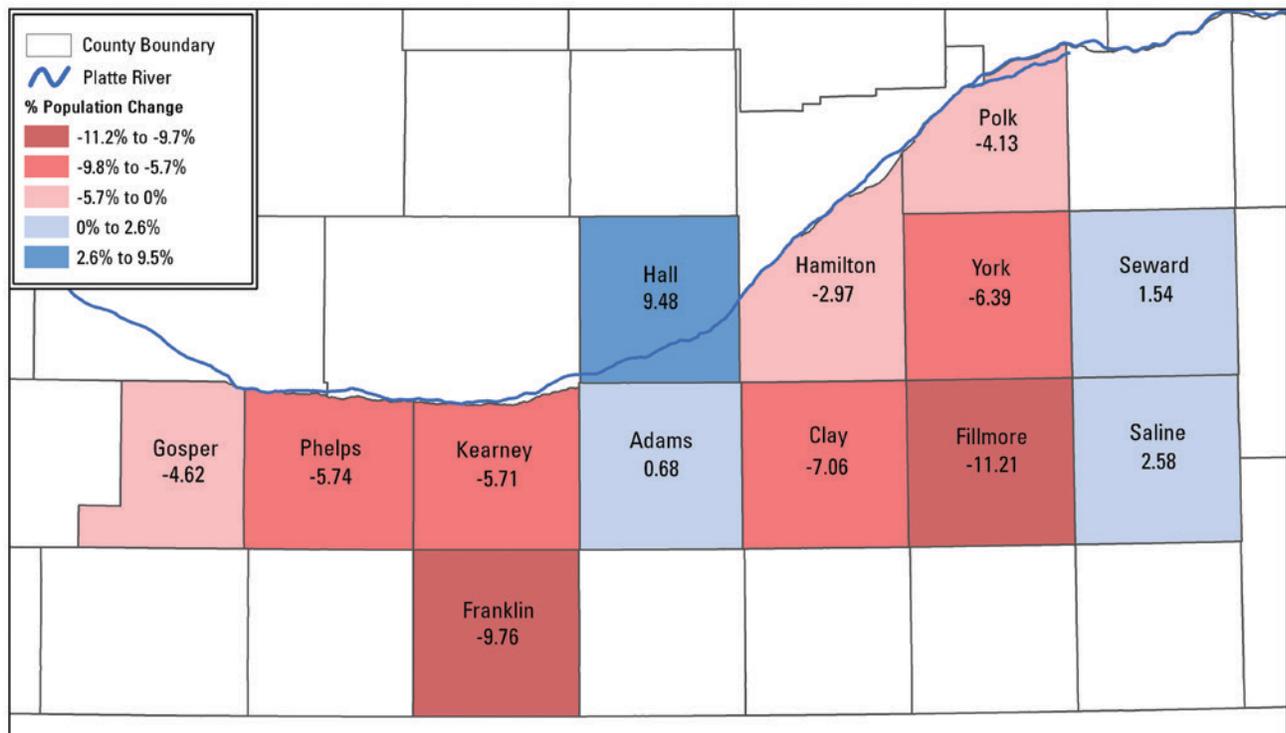


Figure 5. Change in county population size in the Rainwater Basin from the 2000 to 2010 census.

section in section 3 for additional information about agricultural development.

## **PROPERTY TAX**

Property tax is assessed on each property owner within each county. The amount is derived from the value of each parcel of land, based on the reasonable highest and most probable use. The assessed value of agricultural land is no more than 75 percent of market value (NEDOR 2011).

The inflation in land value in recent years has caused taxes on agricultural land to go up disproportionately compared with nonagricultural property, such as homes within communities. For counties with low populations and few commercial properties, agricultural lands may represent well over half of the county's total assessed value. As costs in low-population counties continue to go up, populations go down, and because no new industries are being created, agricultural land claims a higher percentage of the county's total assessed value, placing more of the burden of financing the county on the shoulders of farmers.

The Refuge Revenue Sharing Act provides for payments to counties by the Service in lieu of taxes. Revenues for these payments are derived from the sale of products from refuges, including animals, timber, and minerals, or from leases and other privileges. If there is not enough money in the National Wildlife Refuge Fund to cover payments, Congress is authorized to appropriate money to make up the difference. If the amount that Congress appropriates is not enough, the units of local government receive a pro-rata share. Payment is calculated three different ways, with the amount due being the highest of the

three methods. The three methods are 0.75 percent of the appraised property value, 25 percent of the net receipts produced on the property, or \$0.75 per acre. If the funds in the special Treasury account fall short of 100 percent payment, each county receives payment at a lower percentage. In 2009, refuge revenue-sharing payment to Rainwater Basin counties averaged only 32.3 percent (\$90,983) of full payment.

## **PUBLIC USE AND WILDLIFE-DEPENDENT RECREATIONAL ACTIVITIES**

For much of the past century, access to private property was relatively easy to obtain. Most of Nebraska's population was somehow connected to the land, either by family or by acquaintances. Hunting was seen as recreation that provided little opportunity for revenue to the landowner, and access was freely granted as a neighborly gesture. In the past few decades, this trend has changed. Urban populations are no longer closely connected to the land, and access to private land is more commonly being denied or allowed only on a fee basis.

The result is that the public is relying more on public lands for wildlife-dependent recreation. Within Rainwater Basin, 32 wildlife management areas are managed by the NGPC, and the Service manages 59 WPAs. A total of 31,823 acres is available for public use (USFWS, Grand Island GIS Shop). Pheasant hunting is the most common recreational activity, followed by waterfowl hunting and birdwatching. It is estimated that 81,880 use-days are spent annually on waterfowl and upland bird hunting on State and Federal properties in the Rainwater Basin (Mark Vrtiska, biologist, NGPC; personal communication; May 12, 2010).

## SECTION 4 — ENVIRONMENTAL CONSEQUENCES

This section assesses the environmental impacts expected to occur from the implementation of alternatives A and B, as described in section 2. Environmental impacts are analyzed by issues for each alternative and appear in the same order as discussed in section 2.

### Effects on the Biological Environment

This section describes the effects on wildlife habitat and water and soil resources of carrying out alternatives A and B.

#### **WILDLIFE HABITAT—ALTERNATIVE A (NO ACTION)**

Under alternative A, land acquisition by the Service would continue until the original authorization level of 24,000 acres is reached. At that time, future wetland acquisition would depend on other conservation agencies and nongovernmental organizations. Since the existing authorization limits only the purchase of property, the Service would continue to accept gifts from other entities. For example, the Service could enter into an agreement with a donor to accept ownership of a piece of property to be managed as part of the Refuge System.

Most of the Rainwater Basin wetlands have been determined to be nonjurisdictional wetlands under the Clean Water Act as it is currently being administered. The U.S. Department of Agriculture's Swampbuster Act does not prohibit alteration of wetlands, but it withholds Federal farm program benefits from any person who plants a commodity crop in a wetland that has been converted. Changes in agricultural economics will continue to influence the existence of privately owned wetlands. Over a period of time, total wetland acres and quality are expected to decline under alternative A.

Migratory waterfowl use the numerous shallow, temporary wetlands for feeding and resting, but prefer the larger nearby wetlands for roosting. As the presence of temporary wetlands declines, the value of larger wetlands located in a wetland complex would decline due to fewer food resources.

Wetlands with ownership split between the Service and private landowners would likely remain unrestored because complete restoration would be less likely due to conflicting land uses. These wetlands could also be undermanaged, because in many cases the portion of wetlands in private ownership would remain idle and become dominated by late-successional wetland

plants that provide little to no benefit to migratory waterfowl. The Service would continue to work with neighboring landowners to manage these areas for waterfowl. Participation level, however, would be expected to remain low.

Waterfowl nutritional needs derived from natural wetland foods would remain unmet. As little as 14 percent of the waterfowl diet, as estimated by the Rainwater Basin Joint Venture, would come from wetlands under this alternative. The remainder would continue to come from waste grain, which does not provide needed amino acids and minerals. Over time, as more wetlands are lost, the percentage of natural foods in waterfowl diets would be expected to decline even further.

Because any decline in roosting areas would cause bird populations to become more concentrated on the remaining wetlands, the potential for a major avian disease outbreak would remain high and would be expected to increase over time. Groundwater pumping would be expected to play a more critical role in keeping birds dispersed throughout the region.

#### **WILDLIFE HABITAT—ALTERNATIVE B (PROPOSED ACTION)**

Under alternative B, the expansion of land acquisition across the Rainwater Basin would ensure that critical wetlands are protected in perpetuity. It would allow the Service greater flexibility to consider fee-title or easement acquisition as potential land management strategies. GIS modeling would help to identify wetlands with key biological characteristics that are best suited for fee-title and easement acquisition. This approach would help to ensure that funding is directed to where it can provide the most benefit to priority species.

Purchase of roundout properties would in many ways multiply the benefits of the wetlands beyond what they currently provide in split ownership. It would be easier to use management strategies such as grazing, prescribed burning, restoration, and water management. The Service would continue to partner with neighboring landowners to enhance privately owned wetlands for the benefit of migratory birds.

Natural foods from wetlands would increase, bringing the Rainwater Basin Joint Venture closer to its goal of having 28.2 percent of waterfowl energetic needs met by natural foods rather than waste grain. Birds would be expected to leave the Rainwater Basin region in better body condition, which would in turn mean better production on their northern nesting grounds.

The potential for a major avian disease outbreak would be reduced as more wetlands would be better managed for waterfowl migrations. Pumping and

other forms of water management would remain as management options.

Acquisition and protection of wetlands within the Rainwater Basin would indirectly provide improved water quality to the headwaters of several streams, such as the Big Blue and Little Blue rivers, that currently provide fish habitat.

### **WATER AND SOIL RESOURCES—ALTERNATIVE A (NO ACTION)**

Under alternative A, water quality and quantity would decline and sedimentation would increase over time. It is expected that future wetland loss would increase agricultural and sediment runoff. Runoff flowing out of watersheds would increase, thereby increasing erosion and nutrient loading. The ability of altered wetlands to contribute to groundwater recharge would also decline.

### **WATER AND SOIL RESOURCES—ALTERNATIVE B (PROPOSED ACTION)**

Under alternative B, wetlands that are protected in perpetuity would exist for the long term, providing many of the benefits attributed to wetlands, including entrapment of agricultural fertilizers, chemicals, and sediment. Wetland plants would help convert fertilizers and other farm chemicals into nonpolluting forms. The preserved wetlands would continue to provide groundwater recharge to a currently declining groundwater table.

Alternative B, which would increase the land base of the Service in the Rainwater Basin, would likely reduce long-term management costs; therefore, short-term acquisition costs would likely be made up over the long term by reducing the cost of per acre management. Having management control of a full wetland would allow the Service to restore natural hydrologic function, thereby reducing management costs by allowing the wetland to flood and dry out on its own. In addition, full management of a wetland would reduce potential conflict with neighbors who could have different management plans for use of that wetland.

## **Effects on the Socioeconomic Environment**

The socioeconomic impact of land acquisition within the Rainwater Basin counties is hard to measure with a high degree of certainty. What is known is that there would be reduction in agricultural production and tax revenue associated with Federal acquisition. What is poorly determined or immeasurable are the environmental and social benefits provided by wetlands, especially those located in close proximity to each other

or near a community. Economists often refer to these benefits as nonexcludable (available to all) goods that have a value to the public that exceeds their value to the landowner. For Rainwater Basin wetlands, this value extends beyond the local residents to a much larger area. For example, the birds that use the Rainwater Basin during spring migration are of international value for birdwatching and hunting.

Some local residents perceive themselves as having to unfairly shoulder the burden of maintaining these wetlands for the benefit of others. Their concerns are expressed in the belief that Service acquisition of wetlands contributes to declining county populations, leading to increased land prices and taxes.

### **POPULATION DECLINE**

A review of population changes within counties located in the Rainwater Basin between 2000 and 2010 shows that the greatest decline has been in counties with low (<10,000) populations (U.S. Census Bureau 2010).

Fillmore County, which does not have a large commercial hub, showed the greatest reduction in population (11 percent), declining by 744 people from 2000 to 2010. In contrast, those counties with a larger commercial hub showed an increase in population. Hall County, which includes the community of Grand Island, showed over a 9 percent increase during the same period, increasing by 5,073 people. This trend in population shift among counties was common throughout the State, where counties with small populations and small commercial hubs showed a decrease while counties with larger populations and larger commercial hubs showed an increase.

Even though some residents are concerned that Federal acquisition may lead to a decrease in population, there does not appear to be a correlation between the two. Clay County, for example, showed a population decline of over 7 percent between 2000 and 2010. During that period of time, only 32.5 acres were acquired by the Service. A comparison of Clay County with a nearby county of similar population without Federal lands would help determine if Service ownership may be a contributing factor to population declines. Antelope County, which is comparable to Clay County, does not have a large commercial hub or Federal lands, and it showed a decline of 11 percent. Other Nebraska counties that met the same criteria as Antelope County showed similar trends.

### **RISING LAND PRICES**

Regarding the concern that Service acquisition drives up land prices, a 2010 UNL (University of Nebraska, Lincoln) survey reported that agricultural land values in the Rainwater Basin region increased an average of 2.6 percent annually between 2005 and 2010 (Johnson et al. 2010). During those same 5 years, only 513 acres were acquired in fee title by the Service. In 2009, 74

percent of agricultural lands sold in the Rainwater Basin region were purchased by active farmers, 21 percent were purchased by nonfarming Nebraska residents, and 5 percent were purchased by nonfarming out-of-state buyers.

UNL's survey asked 150 land-market observers to rank the importance of 16 factors in determining land prices. The top three factors listed were purchasing for farm expansion, the limited amount of land offered for sale, and the financial health of the current owners. Property tax levels were ranked 15th out of 16.

In 2009, 68 percent of land purchases in the Rainwater Basin area were cash purchases and 27 percent involved a mortgage; 5 percent of ownership changes involved other types of transactions (e.g., gift, inheritance, etc.). During the last decade, the average rate of return on assets of agricultural land in the Rainwater Basin region dropped from 5.5 to 4.9 percent.

Nationally, farmland values rose throughout much of the post-World War II period, and from 1969 to 1978, farmland prices increased 73 percent as agricultural producers responded to high returns and various Federal policies that increased incentives for investing in agriculture. In 1980, farmland prices began to decline in response to Federal monetary policy that raised interest rates to help resolve high inflation. In

addition to rapidly rising interest rates, higher energy prices contributed to a significant financial crisis in the farm sector during the 1980s, leading to farm bankruptcies and bank failures. Since the farm crisis of the mid-1980s, farmland real estate values (including land and buildings) have been rising in both nominal and real (i.e., inflation-adjusted) terms. Between 1994 and 2004, real values increased between 2 and 4 percent annually (figure 6) and in 2005 and 2006 experienced sharp annual increases of 16 percent and 11 percent, respectively, before slowing to 7 percent and 6 percent annual growth in 2007 and 2008 (USDA 2011).

### INCREASING PROPERTY TAXES

Tax increases are a very contentious issue across the State, including in the Rainwater Basin. While land brought into Federal ownership is no longer on the tax roll, it does not result in an increase in personal property taxes paid to the counties.

For counties with low populations and no commercial hub, agricultural lands represent well over half of the county's total assessed value (Johnson et al. 2006). When county costs continue to go up, populations go down, and no new industries are being created, agricultural land claims a higher percentage of the county's total assessed value, shifting the burden

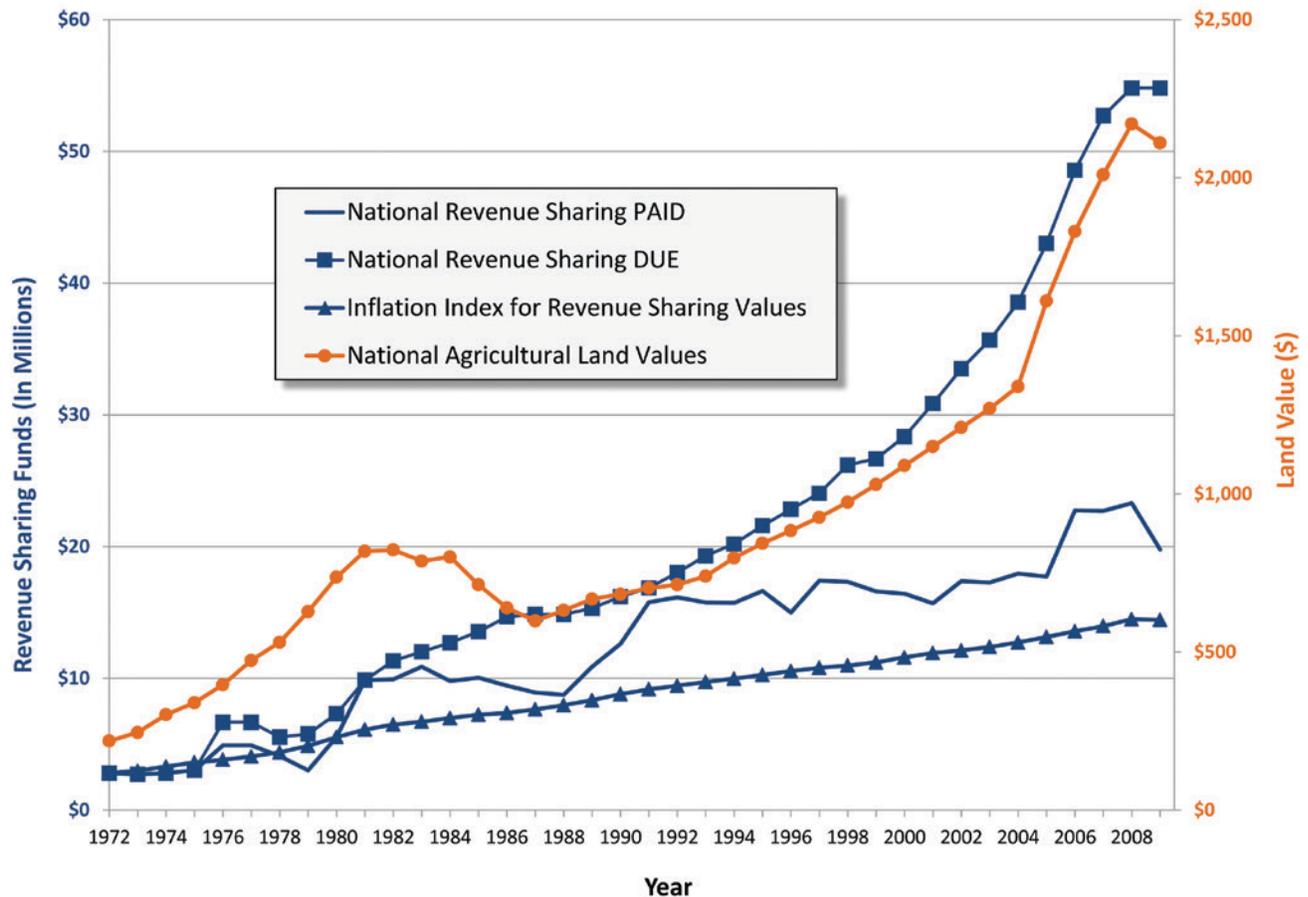


Figure 6. Funds distributed from the National Revenue Sharing program in comparison to national land values, 1972–2009.

of financing the county to the shoulders of farmers. A contrast that demonstrates this concept is that 57 percent of the total assessed value in Clay County is agricultural land, but it is only 22 percent in adjoining Adams County.

The Refuge Revenue Sharing Program has increased payments made to local governments over the long-term; these rates have actually increased at a faster rate than inflation (figure 6). However, payments due to the local governments have risen substantially more, primarily due to increasing land prices, as described in the prior section. This is particularly evident in the period from 2004 to 2008, when land prices rose approximately 10 percent annually, but receipts from the National Wildlife Refuge Fund rose at a substantially lower rate (figure 6). However, the difference between what is paid by the revenue sharing program and what is due does result in lower revenue for local governments. Nonetheless, substantive social benefits are provided by public lands to local communities and economies (see below).

## **SOCIAL BENEFITS**

Although Service lands do not provide the same property tax revenue to the counties that the land would generate in private ownership, there are goods and services produced by these lands that benefit the general public. Some benefit the local community directly in terms of flood control, groundwater recharge, increased water quality, and sediment or fertilizer entrapment. Recreation, aesthetics, and health and production of wildlife may serve the local community as well as a much larger society. Other benefits include reduced need for water and sewer services and increased law enforcement in the local area, thereby reducing costs to local communities.

It is difficult to assign dollar values to these public benefits. The social and environmental benefits provided by the wetlands have very little economic value to an individual buyer; in comparison, the assessed value reflects the land's value for agricultural production. In addition, each wetland provides a specific level of benefits, depending on its unique characteristics, location in the watershed, and proximity to larger communities. For example, WPAs located in the more populated eastern portion of the Rainwater Basin receive much more use, and therefore provide a greater recreational benefit to the local area, than those in the western portion.

Studies exist, however, that suggest some of the value wetlands provide to the public. In 1978, the Little Blue Natural Resources District hired an engineering firm to provide a cost-benefit analysis of a watershed plan in Clay County. The analysis reported that a 650-acre impoundment would have an estimated annual benefit value of \$97.37 per acre. This value was based on only three benefits: \$52.75 per acre for groundwater

recharge, \$41.14 per acre for flood control, and \$3.46 per acre for recreation. The \$97.37 in 1978 is equivalent to approximately \$320 in today's economy. The estimate did not include the value of other services provided, such as capturing and transforming agricultural runoff or sustaining migratory bird populations.

A limited amount of agricultural benefit is provided by WPAs. In 2009, approximately 12,600 animal-unit months of grazing were provided. An additional 1,150 acres were hayed.

Publicly owned wetlands within the Rainwater Basin bring many hunters and birdwatchers to the region. The 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reports that the average hunter in Nebraska spends about \$25 per day on trip expenses (food, lodging, and fuel). For birdwatchers, that number is \$31.50 per day. The Service estimates that there are approximately 80,000 visitor-days within basin WPAs each year. Using the \$25 per visitor-day figure, that number of visitor-days brings \$2 million of commerce to the region. NGPC estimates that upland game and waterfowl hunting provides \$2,374,520 of economic activity to the Rainwater Basin (Mark Vrtiska, biologist, NGPC; personal communication; 2011).

These figures demonstrate that the value of benefits provided by WPAs is significant.

## **LANDOWNERSHIP AND LAND USE— ALTERNATIVE A (NO ACTION)**

Under alternative A, many of the wetlands targeted for acquisition under this proposal would remain in private ownership and on the county tax rolls. An unknown number of them would be converted to cropland during drier conditions, but there could be significant variations in production between wet and dry years.

## **LANDOWNERSHIP AND LAND USE— ALTERNATIVE B (PROPOSED ACTION)**

Under alternative B, 14,177 additional acres of land (0.36 percent of the Rainwater Basin region) would be permanently protected. The adjoining upland and drained portions of wetlands would be converted from cropland back to grassland and wetlands. Agricultural income from the 5,000 acres of easements would be derived from livestock grazing and haying.

The 9,177 acres purchased in fee title would be taken off the county tax rolls with the counties receiving refuge revenue sharing funds to help compensate for the loss of tax money.

Lands with a conservation easement would remain on the tax rolls, and the taxes would be paid by the landowner. Land use on these properties would be limited to the terms of the easement, which would allow haying, grazing, and control of public access.

**PUBLIC USE—ALTERNATIVE A (NO ACTION)**

Under alternative A, public use would remain relatively unchanged. Public access to wetlands targeted for acquisition under this proposal would be limited, with the property owner deciding the level of access. Public pressure on those wetlands currently in public ownership would increase, potentially affecting wildlife use of wetland areas.

**PUBLIC USE—ALTERNATIVE B (PROPOSED ACTION)**

Under alternative B, additional fee-title properties would be open to public recreation, including hunting, birdwatching, and environmental education. An increase in direct and indirect revenue from recreation would increase. Public pressure on and wildlife disturbance to individual wetlands would lessen as more areas would be available for use.

Properties with conservation easements would remain in private ownership. Access to the property would be at the discretion of the landowner since the easement would not include public use.

**VALUE OF THE RAINWATER BASIN ECOSYSTEM—ALTERNATIVE A (NO ACTION)**

Under alternative A, the level of wetland protection would remain relatively unchanged. Wetlands with split ownership between the Service and private landowners would continue to have limited benefits, especially for waterfowl. Over time the number of wetlands regionwide would be expected to continue to decline both in numbers and functionality.

**VALUE OF THE RAINWATER BASIN ECOSYSTEM—ALTERNATIVE B (PROPOSED ACTION)**

Alternative B would not completely restore the Rainwater Basin ecosystem, but it would help to reduce the threat of further wetland losses in the area. Nearly 90 percent of the region's wetlands would remain lost. Wetlands that are permanently protected would help ensure that the region continues to play a critical role in the migration of millions of ducks, geese, shorebirds, and other birds. The wetland values of the acquired areas would continue to provide better water quality, quality of life, and wildlife habitat for many generations.

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## Unavoidable Adverse Impacts

Any adverse effects that may be unavoidable while carrying out alternatives A and B are described below.

**ALTERNATIVE A (NO ACTION)**

Under alternative A, the adverse impact of habitat degradation and fragmentation would be expected to be more widespread and prevalent.

**ALTERNATIVE B (PROPOSED ACTION)**

Under alternative B, the expansion of land acquisition would cause a direct decline in taxes paid to counties.

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## Irreversible and Irrecoverable Commitments of Resources

Any commitments of resources that may be irreversible or irretrievable as a result of carrying out alternatives A and B are described as follows.

**ALTERNATIVE A (NO ACTION)**

Under alternative A, there would be no additional commitment of resources by the Service. Wetlands converted to cropland, especially irrigated cropland, would be irretrievable because their natural function would be lost, contributing to the overall loss of migration habitat.

**ALTERNATIVE B (PROPOSED ACTION)**

Under alternative B, there would be an irretrievable and irreversible annual commitment of funds to protect and manage these lands. The potential for properties to be used for crop production by private landowners would be removed in perpetuity, unless the Service divested interest in such lands in the future.

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## Short-Term Use versus Long-Term Productivity

This section describes the effects of short-term use versus long-term productivity of alternatives A and B.

**ALTERNATIVE A (NO ACTION)**

Under alternative A, landowners would be able to convert wetlands to cropland, which would boost agricultural production but would also have a long-term negative effect on migratory bird habitat.

**ALTERNATIVE B (PROPOSED ACTION)**

Under alternative B, land acquisition would preserve wetlands and adjoining grasslands in perpetuity. The loss of direct tax revenue to the affected counties would have a long-term impact.

## Cumulative Impacts

Cumulative impacts are defined by NEPA as the impacts on the environment that result from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR § 1508.7)

### PAST ACTIONS

Past land acquisition by the Service and the NGPC has included 31,823 acres of wetland and grassland. The Wetlands Reserve Program administered by NRCS has added 7,077 acres in conservation easements. The total of these acres represents approximately 1.0 percent of the Rainwater Basin. These lands are managed primarily for the social benefits that wetlands provide, especially habitat for wetland and grassland birds.

### PRESENT ACTIONS

The Service's proposed action to expand land acquisition authority to 38,177 acres would add an additional 14,177 acres to the Refuge System, 5,000 of which would be conservation easements. Land acquisition by NGPC is limited and is driven by available funds and willing sellers. The Wetland Reserve Program continues to be an active program. The Wetlands Reserve Program areas, however, are not open for public use. Ducks Unlimited is actively seeking willing sellers and is obtaining both fee-title and easement properties. Its acquisitions are directed toward purchasing property, restoring the wetland and upland, protecting the property with a conservation easement, and then selling the property. Present actions by conservation groups support the goals of the Service and the Rainwater Basin Joint Venture.

### REASONABLY FORESEEABLE FUTURE ACTIONS

Reasonably foreseeable actions are actions and activities that are independent of the proposed expansion addressed in this document. They are anticipated to occur regardless of which alternative is selected. Increased production of ethanol and demand for corn and soybeans are expected to encourage increased acreage of, and production from, farmland. A significant portion of that increased acreage can be expected to come from the conversion of wetland to farmland. Future wetland conservation will be done primarily by the U.S. Department of Agriculture and nongovernmental conservation organizations.

Wind energy development is currently being considered for the region. The potential for this development is speculative at this time.

## Development—Alternative A (No Action)

Much of the development within the Rainwater Basin has been and would continue to be related to agriculture. Since 90 percent of the historical wetlands have already been converted or lost, the number of wetlands that would be affected by additional development would be small, but would significantly affect the wetlands that remain. For example, over 2,300 acres of grassland were converted to cropland in just four counties within the basin in 2009. The long-term, cumulative effect would likely be the continuation, and possible acceleration, of the decline in waterfowl, shorebird, and other migratory bird populations.

## Development—Alternative B (Proposed Action)

The proposed action would restore and protect an additional 14,177 acres of wetland and grassland areas for the benefit of the public and wildlife.

## Conservation Efforts—Alternative A (No Action)

Under alternative A, current Service programs such as Partners for Fish and Wildlife would continue. The Service would continue to work cooperatively with landowners to voluntarily improve habitat on private land through various conservation means, such as prescribed fire or native plantings. Landowners wishing to sell off unproductive wetland acres would have fewer options for selling.

## Conservation Efforts—Alternative B (Proposed Action)

Alternative B would allow for the protection of an additional 14,177 acres of wetland and grassland habitats. These acres would be added to the 23,855 acres currently owned and managed by the Service. The action would have a long-term positive impact on wildlife habitat, significantly add to the management capability for existing wetlands, and help the Service meet the goals in the North American Waterfowl Plan.

## SECTION 5 — COORDINATION AND ENVIRONMENTAL REVIEW

### Agency Coordination

The Service has discussed the proposal to expand land acquisition in the Rainwater Basin with landowners; conservation organizations; other Federal agencies; tribal, State, and county governments; and other interested groups and individuals.

The Service held two public meetings, in Holdrege and Clay Center, Nebraska, in January 2011 to provide information and discuss the proposal with landowners and other interested citizens. Information on the proposal has been made available to county commissioners in each of the 13 counties included in the project area.

The Service released the draft EA and LPP on May 31, 2011, for a 30-day public review period. This period was extended 2 weeks until July 15, 2011, allowing a 45-day public review period. In total, the Service received 7 letters from agencies, organizations, and other entities; 58 general public comments; and 3 phone calls. After all comments were received, each was reviewed and incorporated into the administrative record (appendix D). A separate request for further discussion with the Clay County Board of Supervisors was met on August 16, 2011.

At the Federal level, information was provided to the Congressional delegation, as well as to representatives from the U.S. Department of Agriculture (NRCS). At the State level, information was provided to Governor Heineman's staff and Nebraska's State senators. Information was also provided to tribes within the State.

Nongovernmental conservation groups are vital to the success of the proposed project. Service staff has coordinated with partner organizations such as The Nature Conservancy, natural resource districts, and Ducks Unlimited.

### Contaminants and Hazardous Materials

Surveys for contaminants would be conducted before any land interests are acquired. Field work for the preacquisition surveys would be conducted on a tract-by-tract basis. Any suspected problems or contaminants requiring additional surveys would be referred to a contaminant specialist located in the Service's Ecological Services office in Grand Island, Nebraska.

### National Environmental Policy Act

As a Federal agency, the Service must comply with the provisions of NEPA. An EA is required under the act to evaluate reasonable alternatives that will meet stated objectives and to assess the possible impacts to the human environment. The EA serves as the basis for determining whether implementation of the proposed action would constitute a major Federal action that would significantly affect the quality of the human environment and the need for an environmental impact statement.

The analysis for, and development of, this EA facilitated the involvement of government agencies and the public in the decision-making process.

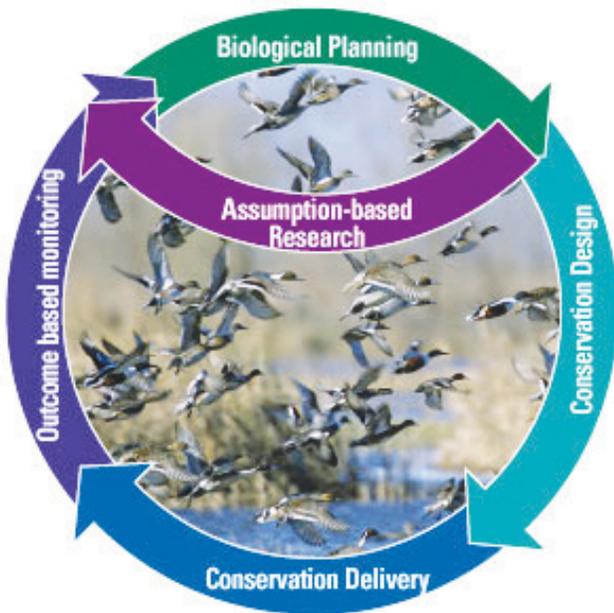
### Strategic Habitat Conservation and Landscape Conservation Cooperatives

SHC (strategic habitat conservation) is a means of applying adaptive management across large landscapes. LCCs (landscape conservation cooperatives) facilitate strategic habitat conservation (USFWS 2008).

#### STRATEGIC HABITAT CONSERVATION

The Rainwater Basin expansion proposal would apply the SHC framework outlined in the National Ecological Assessment Team report (National Ecological Assessment Team 2006). SHC involves an ongoing cycle of biological planning, conservation design, conservation delivery, outcome-based monitoring, and assumption-based research (figure 7). It is the process by which the Service continues to develop and apply science in a way that is focused on improving the ability to apply conservation delivery actions and create landscapes that are capable of supporting populations of priority species at desired levels. Additionally, SHC provides the framework by which the Service develops and applies science to inform and continually improve conservation delivery by addressing landscape-level population-limiting factors in an adaptive manner.

The Service's Region 6 Refuges Program has established a GIS office in Grand Island that works closely with the Rainwater Basin Joint Venture and the Rainwater Basin Wetland Management District



**Figure 7. The elements of strategic habitat conservation.**

to provide support for the biological planning, conservation design, conservation delivery, and monitoring/research elements of SHC necessary to implement the proposed action. This EA addresses the four key SHC elements: planning, design, delivery, and monitoring and research.

## BIOLOGICAL PLANNING

Priority resources were described in earlier sections of this document. Biological planning requires the identification of priority species, development of population objectives, and identification of landscape-level limiting factors that keep the populations of priority species below desired levels. Initial biological planning was done using dabbling ducks and a subset of goose populations as focal species. This approach was based on the assumption that protection and management of wetlands in a manner that meets the biological needs of the focal species will also adequately meet the needs of other wetland species.

Conceptual and quantitative models have been developed to identify specific wetlands and wetland complexes. Priority species would continually be defined and updated throughout the implementation of the proposed action, and additional landscape models would be developed for priority species. Biological planning will continue into the future, engaging partners in the population objectives and developing biological models that will be directly linked to conservation delivery actions.

## CONSERVATION DESIGN

Land acquisition is most effectively completed using biologically driven, spatially explicit models. During

the past decade, the Service, in cooperation with the Rainwater Basin Joint Venture, has used GIS to extensively map the Rainwater Basin region. This modeling has enabled the Service to identify and rank each hydric soils area, including both drained and existing wetlands. Key spatial and biological characteristics of each area were scored to determine which wetlands are cost effective to acquire and restore. The analysis considered the impacts of geographic features, such as the proximity of other wetlands, roads, and power lines to individual wetlands. Color-coded maps reflect an individual wetland's priority for fee-title acquisition, easement, and other types of conservation programs.

The information obtained from the models was also used in conjunction with the management history of existing WPAs to identify where roundout acquisition is most needed.

## CONSERVATION DELIVERY

The Rainwater Basin Wetland Management District has worked with neighboring landowners, conservation organizations, and government agencies for almost 5 decades to preserve and enhance wetlands throughout the region. Beginning in the early 1990s, Partners for Fish and Wildlife biologists have worked with the same partners to bring conservation programs to wetland owners regardless of their proximity to existing Service properties. Application of the SHC framework will build on existing partnerships and support the development of new partnerships for delivering conservation throughout the region.

It is recognized that the past practice of opportunistic acquisition will not result in the best use of conservation dollars. The function of some wetlands can best be used or enhanced by short-term conservation programs. Computer modeling of waterfowl energetic needs as well as wetland priority mapping allow for greater flexibility, increased responsiveness, and improved efficiency in meeting Service and partner conservation delivery needs.

Conservation design will continue to involve the development of spatially explicit decision support tools for targeting conservation delivery actions. Research and monitoring will help update the modeling parameters used to develop conservation priorities.

## MONITORING AND RESEARCH

The success of the proposed action would depend on its ability to adapt to new and better information gathered through monitoring and research. Currently, monitoring and research are being done on a variety of subjects to provide for better decision making in the future. At the end of each growing season, wetlands are examined to assess the response of plant communities and seed production to different management actions. This information is being used to develop a strategic decision-making matrix to guide

future management. Bird use associated with wetland juxtaposition is being analyzed to confirm if our current understanding of wetland complexes aligns with what occurs in the field. A study of the relationship between groundwater recharge and wetland characteristics was recently completed. Research related to grazing intensity and its impact on the control of reed canarygrass is beginning its final year. Information from these studies and future work on landscape ecology will be incorporated into the SHC process to further refine biological planning.

### **LANDSCAPE CONSERVATION COOPERATIVES**

The Service will use LCCs as a means of implementing strategic habitat conservation. LCCs will be formal scientific and management partnerships between the Service, the U.S. Geological Survey, other Federal agencies, States, tribes, nongovernmental organizations, universities, and others to increase the capacity for applied conservation science in support of fish and wildlife management in specific landscapes (Secretarial Order Number 3289). The tools developed by the LCCs will allow Service offices, and our many partners, to implement on-the-ground actions in the most effective locations to meet conservation goals.

The Rainwater Basin Expansion Project is part of the Great Plains LCC, which was recently developed. The project meets the criteria of the LCC initiative: cooperation among private landowners and other agencies (Federal, State, local, and nongovernmental organizations). In addition to fostering partnerships, the LCCs provide science support to managers.

The Secretary of the Interior recently outlined the importance of LCCs as a response to climate change (USFWS 2009). LCCs reach across broad landscapes, involve many partners, and function at a scale necessary to address wildlife adaptation in response to climate

change. The Rainwater Basin Expansion Project would contribute to the wetland protection projects of Ducks Unlimited, NGPC, natural resource districts, and the U.S. Department of Agriculture.

These cooperatives will continue to grow as a means of delivering strategic habitat conservation. The Service and the U.S. Geological Survey have signed a memorandum of understanding to strengthen the science–management relationship in landscape-level conservation. This further commitment to strategic habitat conservation improves the basis for the type of landscape conservation being proposed.

## **Distribution and Availability**

Copies of this EA were sent to Federal and State legislative delegations, tribes, agencies, landowners, private groups, and other interested individuals.

Additional copies of the document are available from the following offices and Web sites:

U.S. Fish and Wildlife Service  
Rainwater Basin Wetland Management District  
P.O. Box 8  
Funk, Nebraska 68940  
308 / 263 3000  
<http://rainwater.fws.gov>

U.S. Fish and Wildlife Service  
Region 6, Division of Refuge Planning  
Branch of Land Protection Planning  
P.O. Box 25486–DFC  
Denver, Colorado 80225  
303 / 236 4345  
303 / 236 4792 fax  
<http://mountain-prairie.fws.gov/planning/lpp.htm>



# Appendix D

## *Comments and Responses*

### Summary

The Service released the draft Environmental Assessment (EA) and Land Protection Plan (LPP) on May 31, 2011, for a 30-day public review period. This period was extended 2 weeks until July 15, 2011, allowing a 45-day public review period. In total, the Service received 7 letters from agencies, organizations, and other entities; 58 general public comments; and 3 phone calls. After all comments were received, each was reviewed and incorporated into the administrative record. A large majority of comments received were supportive (>88 percent) and highlighted the importance of the Rainwater Basin to migrating birds and secondary uses such as hunting and bird watching. One letter requested further information and discussion with the local county government. That request was honored by the Service on August 16, 2011.

Comments were reviewed for substantive information that should be incorporated into the analysis. Comments were considered substantive if they met one of the following criteria:

1. Questions, with reasonable basis, the accuracy of information in the EA;
2. Questions, with reasonable basis or facts, the adequacy of, methodology of, or assumptions used for the environmental analysis;
3. Presents reasonable alternatives other than those presented in the EA;
4. Or prompts the Service to consider changes or revisions in one or more of the alternatives.

The following numbered comments were considered substantive comments from the general public; letters from agencies or organizations containing comments follow the letters from the general public. All comments received on the Service's NEPA documents become part of the official public record. Requests for information contained in comments are handled in accordance with the Freedom of Information Act, NEPA (40 CFR § 1506.6(f)), and other Department of the Interior and Service policies and procedures. In compliance with Service policy about disclosure of personal information, the Service will not publish in this document the name, address, or other personal information about an individual who commented unless

that information was spoken in a public meeting; this non-disclosure policy does not apply to agencies or organizations.

### Public Comments and Service Responses

**Comment 1.1.** "From what I understand the goal of the increased land base is to focus on "rounding out" existing WPAs so the WMD can have full management control of the wetland. Obtaining full management control over entire wetland footprints through ownership or easements will allow the WMD to better manage the properties for waterfowl, shorebirds, and whooping cranes. This plan increases the land base of the WMD but will likely reduce long term management costs - therefore short term acquisition costs will likely be made up over the long term by reducing the cost of per acre management. Having management control of a full wetland will allow the WMD to restore natural hydrologic function, therefore letting the wetland help manage itself by naturally flooding and drying out on its own. Also, without having to work around neighbors, remnant hydrologic modifications, and other management impediments the entire wetland can likely be managed with the same staff time and management cost as a partially controlled & unrestored wetland."

**Response 1.1.** The Service agrees with this comment and has modified the EA (Section 4 – Water and Soil Resources) to reflect this point.

**Comment 1.2.** "The WMD owning the entire wetland footprint will likely help improve public relations with local residents and the general public. Owning the entire wetland may help reduce potential conflict with neighbors that may have different management/use priorities of the wetland. The general public will see a more aesthetically pleasing and better managed property. Hunters will have more and better public access."

**Response 1.2.** The Service agrees with your analysis and has modified the EA (Section 4 – Social Benefits) to reflect this point.

**Comment 1.3.** "The economic impact the acquisitions may have on the local tax base should be minimal. Wetlands

likely targeted for expansion are not productive agricultural land likely do not currently contribute much in the way of local tax revenue due to the land being classified as marginal, pasture, or waste land. Using easements on the more productive land and acquisition of the least productive could help keep as much land on the tax roles. Increasing local government aid payments on FWS owned land would go a long way to help improve relations with local government entities and offset the minimal economic loss.”

**Response 1.3.** The Service has developed prioritization models in partnership with the Rainwater Basin Joint Venture and uses those models in connection with the Strategic Habitat Conservation model outlined in section 5 of the EA.

**Comment 2.** “My only specific comment is about “Irreversible and Irrecoverable Commitments of Resources”. I’m not sure either alternative result in absolutely irreversible consequences. Under Alternative A, No action, though unlikely, wetlands converted to cropland may still be restorable by a future owner if the hydrology alteration would be a rather simple ditch, pipe, and/or pit that could be closed. Wetlands obliterated by earth fill are much more irreversibly gone. Under Alternative B, Proposed Action, you assume management of these lands as habitat is perpetual. Availability for use as cropland would be changed, but not capability. The designation of land as habitat is a paper exercise of ownership and easements that could change in the distant future, if priorities in our society change. The land is not physically changed, therefore capable of possible conversion to cropland any time in the future if made available. Rather than irreversible habitat designation, I see this as passing choices to future generations in hopes that keeping some of these special habitat areas will remain a priority for them.”

**Response 2.** The Service agrees that hydrology of a disturbed wetland can be restored in certain circumstances, which were identified. Language in the EA (section 4 – Irreversible and Irrecoverable Commitments of Resources) has been modified to reflect this point. In regards to easement terms, it is the Service’s policy that easement terms and conditions cannot be modified without coordination and just compensation to the private landowner.

**Comment 3.1.** “The gifted acres (4,505) are not listed in the accounting of the land owned or its type. How are these acres used and why aren’t they part of the accounting?”

**Response 3.1.** The Service has added clarification to section 1 of the EA regarding gifted acres. The management of these properties was transferred from other Federal agencies, primarily the Farmers Home Administration. Although the Service owns and

manages these properties, there were not acquired under the authorities of the National Wildlife Refuge System and therefore are not considered part of the total acreage.

**Comment 3.2.** “I agree that wetland habitat is important, TOO important to delay management of wetlands as in this example 90% of the wetland is owned by US-FWS. Management of land already owned should be first priority. Find a way to do it. Turn over a new leaf and figure out how it CAN be done. Acquiring more property is not the answer, when you cannot find a way to manage what you already have.”

**Response 3.2.** Waterfowl production areas are currently managed according to the Rainwater Basin Wetland Management District Comprehensive Conservation Plan (CCP) that was approved in 2007. This plan, which incorporated public input and ideas, guides the direction and management of all properties within the District. The CCP identified land acquisition as one of the implementation strategies to properly manage wetlands in the Rainwater Basin.

**Comment 3.3.** “I am concerned about the ability and commitment of owners (local and absentee) to provide future management. Arranging for haying or grazing, fencing, control of weedy species and other invasive species and overall management. What happens when the money is all gone? Will taxes continue to be paid? Will management be done? Will it become a burden to the county? I see too many examples of owners who do not control noxious weeds. Who is going to monitor these properties for compliance with their contract? Who is going to pay the costs of this monitoring? Those who own the easements would like to turn those responsibilities over to the local government, but make no mention of paying the costs.”

**Response 3.3.** The Service assumes this comment is directed toward purchase and future management of conservation easements. Conservation easements purchased by the Service typically prohibit the alteration of wildlife habitat and/or wetland hydrology. Property taxes remain a responsibility of the private landowner, and landowners defaulting on property taxes would be handled by the appropriate agency. The Service monitors each easement for compliance with easement terms on an annual basis. If a situation such as a noxious weed invasion is documented, the Service will attempt to work with that landowner through the Partners for Fish and Wildlife Program to enhance the easement property. However, the Service can only legally enforce the terms set forth in the easement contract.

**Comment 3.4.** “Meeting wildlife nutritional needs. What practices need to be implemented? Improved management is a pretty broad term, and I use it myself

without defining my intentions. The only identifiable action suggested, is the acquisition of more wetlands. If we don't understand the practices needed on current wetlands, how do we know what to do in the future? Are there practices that I could apply to my wetland? How does current management score in a critical review of implementation and success of practices being applied? Is USFWS meeting management goals on all properties now under its control?"

**Response 3.4.** The CCP mentioned in Response 3.2 outlines the detailed management direction, implementation strategies, and course to monitor the effectiveness of those strategies. The CCP outlines various actions outside of wetland acquisition to improve wetland condition and health. In regards to the commenter's question about what can be done on the commenter's wetland, the CCP and the Partners for Fish and Wildlife Program offer several management scenarios that can be developed for a particular wetland. The Service has recently expanded its Inventory and Monitoring Program to look at refuge management practices across the nation and effectiveness of various techniques.

**Comment 3.5.** "This draft downplays the opportunities that exist through shorter contracts. In short USFWS wants ownership or permanent easements. It misses the opportunity to get a landowner started on the right path to wetland improvement. It may or may not be successful for long term protection. But not starting to protect the wetland is worse. If the landowner had enough interest in habitat to enter the initial contract, there is a chance he will be willing to continue. It will depend on his experience with the contract. That landowner will be responsible for ongoing management and taxes, in return he will receive annual payment."

**Response 3.5.** The LPP developed for this project is designed to be one of several options for willing private landowners. The Service's Partners for Fish and Wildlife Program is a private lands program that works with landowners to evaluate the many different conservation projects that are available, some of which have term contracts. Conservation easements or fee-title acquisition are just one of the tools that are available to willing landowners in the Rainwater Basin.

**Comment 3.6.** "Does Antelope County have a government owned facility comparable to the U.S. Meat Animal Research Station?"

**Response 3.6.** No, the purpose of comparing Antelope County to Clay County was to illustrate that many rural areas in Nebraska are unfortunately showing

population declines, even without the presence of Federal land ownership such as Antelope County.

**Comment 3.7.** A comment was received showing an analysis of taxes paid by private landowners in Clay County versus the Refuge Revenue Sharing Act. To paraphrase, their analysis showed that \$99,882 in taxes was made up by Clay County taxpayers in 2009, versus that land being in private ownership. The commenter further states that \$1,200,000 is lost in agricultural production and that the Refuge Revenue Sharing funds are inadequate to meet obligations as landowners.

**Response 3.7.** The Service understands that the Revenue Sharing Act does not typically provide funds similar to those that private landowners would pay. Refuge revenue sharing funds are obtained from the net income the Service receives from products or privileges like timber sales, grazing fees, and right-of-way permit fees, which are deposited in the National Wildlife Refuge Fund for revenue sharing payments. If there is not enough money in the National Wildlife Refuge Fund to cover payments, Congress is authorized to appropriate money to make up the difference. If the amount Congress appropriates is not enough, the units of local government receive a pro-rata share. The Service is also mandated to provide habitat for and protect migratory bird species for the greater human environment. Although agricultural lands may produce more economic revenue than wildlife habitat, section 4 of the EA (Social Benefits) outlines the social benefits of wildlife habitat, many of which are difficult or impossible to assign dollar amounts to. These include groundwater recharge, flood control, increased water quality, sediment and nutrient entrapment, recreation, aesthetics, and health and production of wildlife, all of which are important and necessary for the American public.

**Comment 4.1.** "There is no scientific proof which documents a 'need.'"

**Response 4.1.** The Service respectfully disagrees with this comment and encourages the commenter to thoroughly review section 1 (Purpose and Need for the Proposed Action) of the EA. This section outlines extensive waterfowl energetic models that show energy sources are highly dependent upon agricultural fields. The proposed action attempts to reduce the heavy use of agricultural fields by waterfowl by shifting them to public wetlands. Furthermore, the EA identifies a large loss in wetland numbers and function that are extremely important for migrating birds.

Letter #1—Ducks Unlimited

Service Response to Letter #1

Thank you for your comments.

2550 North Diers Avenue, Suite L  
Grand Island, NE 68803  
Cell: (308) 382-8075  
Fax: (308) 382-3688  
www.ducks.org



June 26, 2011

Mr. Ronnie Sanchez  
U.S. Fish and Wildlife Service  
Rainwater Basin Wetland Management District  
P.O. Box 8  
Funk, NE 68940

Dear Mr. Sanchez

Ducks Unlimited fully supports expansion of the Rainwater Basin Wetland Management District. Nebraska's Rainwater Basin provides some of the most important migratory bird habitat in the Central Flyway. Millions of ducks, geese, shorebirds, wading birds and other migratory birds depend on this habitat, particularly during spring migration. Unfortunately, the vast majority of wetlands in this landscape have been drained or severely altered. It is imperative that the Wetland Management District's ability to acquire and protect wetlands be expanded to ensure that adequate wetland habitat exists to meet the needs of migratory birds not only today, but also in the future. Data available today clearly indicates that the remaining wetlands in this landscape do not, and simply can not, provide the energy demands needed by the millions of birds that stop here each spring. It is clear that additional wetlands need to be restored and protected to ensure that migratory bird populations are provided with sufficient habitat to maintain healthy populations. Ducks Unlimited is supportive of this effort and will remain committed to assisting the U.S. Fish and Wildlife Service in achieving this important goal.

Sincerely,

Steve Donovan  
Manager of Conservation Programs, Ducks Unlimited, Inc.

## Letter #2—Iowa Tribe of Oklahoma

### Service Response to Letter #2

Thank you for your comments.



#### Iowa Tribe of Oklahoma

R.R. 1, Box 721  
Perkins, Oklahoma 74059  
(405) 547-2402  
Fax: (405) 547-1032

July 12, 2011

United States Department of the Interior  
Attn: Nick Kaczor  
PO Box 25486, DFC  
Denver, CO 80225

Mr. Kaczor,

The Iowa Tribe of Oklahoma has completed the review of the draft environmental assessment (EA) of the Rainwater Wetland Management District in Nebraska.

After review, we found nothing wrong with the proposed EA for that expansion. As a federally recognized tribe, we have worked diligently to ensure the protection of our natural resources, with respect to migration patterns for birds. Our Tribe has worked with USFWS for several years in the rehabilitation and release of injured eagles. The tribe has also ensured the safety and quality of our wetlands and water resources to allow for the movement of birds through the migration corridors in Central Oklahoma. One of our goals is to improve the environment to make it more suitable for wildlife, both flora and fauna, not only for our generation, but for generations to come.

We respect the work that you are trying to accomplish and feel that the expansion would be beneficial to wildlife and the environment as a whole.

Thank you for the work that you are doing for the proliferation of our natural resources.

Sincerely,

Janice Rowe-Kurak  
Chairman  
Iowa Tribe of Oklahoma

Letter #3—The Nature Conservancy (page 1 of 2)

Service Response to Letter #3



Ronnie Sanchez, District Manager  
Rainwater Basin Wetland Management District  
73746 V Road, P.O. Box 8  
Funk, NE 68940

June 30, 2011

Re: Rainwater Basin Wetland Management District Proposed Expansion

3.1

3.1 Thank you for your comments.

Thank you for the opportunity to comment on the draft Environmental Assessment and Land Protection Plan for the proposed expansion of the Rainwater Basin Wetland Management District. These comments are submitted on behalf of The Nature Conservancy in Nebraska.

The Nature Conservancy is an international, non-profit conservation organization working around the world to protect ecologically important lands and waters for nature and people. The Conservancy's mission is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. Our on-the-ground conservation work is carried out in all 50 states and more than 30 foreign countries. The Conservancy has helped conserve nearly 15 million acres of land in the United States and Canada and more than 102 million acres with local partner organizations globally. We have been actively conserving important habitats in Nebraska for more than 30 years.

The Nature Conservancy (TNC) supports Alternative B (the proposed action), increasing the District's land acquisition goal from 24,000 acres to 38,177 acres. This would be done by adding 9,177 acres in fee title and 5,000 acres in perpetual conservation easements. Overall, these increases represent only 0.36 of the Rainwater Basin Region's total area.

Nebraska's Rainwater Basin wetlands supply habitat for a diverse range of avian and terrestrial wildlife: 422 wetland plant species, 329 bird species, 68 mammals, 13 amphibians, and 42 reptile species have been documented within the District. For a number of bird species, large

## Letter #3—The Nature Conservancy (page 2 of 2)

### Service Response to Letter #3

percentages of their mid-continental populations critically depend on District habitats during their annual migrations. The region's designation in 2009 as a Landscape of Hemispheric Importance by the Western Hemisphere Shorebird Reserve Network attests to its global value to migratory birds.

Historical and continued loss of these critical habitats due to anthropogenic causes has heightened the need to increase public land acquisition and preservation, as documented in the draft environmental assessment. Currently only 16% of historical wetlands retain some function and only 8.5% are in public ownership.

The Nature Conservancy in Nebraska has previously assisted partnering agencies in acquiring and protecting wetland habitats within the District. We fully support the goal of conserving this region's unique and globally important ecological landscape by maintaining and enhancing the hydrology, flora, and fauna of wetlands within the District. By expanding the lands owned, restored, and managed in perpetuity by the District, as well as placed under perpetual conservation easement, increased acres of high-quality habitat will be available to support the region's full biological diversity in a more sustainable manner.

If Alternative B is approved and implemented, TNC would recommend the following actions:

- 1) Use of the prioritization model developed by the Rainwater Basin Joint Venture to inform the selection of those acres to be acquired in fee title and those placed under conservation easement.
- 2) Payment in lieu of property taxes on any new acres acquired in fee title.
- 3) Management of acquired lands not just for migratory waterfowl but also for species listed as Tier I and II conservation priorities in Nebraska's Natural Legacy Plan.
- 4) Development and implementation of monitoring protocols to test, and improve as needed, current management practices for maximizing wetland resilience and biological diversity.

Thank you again for the opportunity to provide our comments.



Mace Hack, Ph.D.  
State Director  
The Nature Conservancy  
1007 Leavenworth Street  
Omaha, NE 68102  
mhack@tnc.org  
402-342-0282

3.2 The Service agrees with action 1 and will coordinate with the Rainwater Basin Joint Venture on prioritization of land acquisitions.

3.3 Refuge revenue sharing funds are obtained from the net income the Service receives from products or privileges like timber sales, grazing fees, and right-of-way permit fees, which are deposited in the National Wildlife Refuge Fund for revenue sharing payments. If there is not enough money in the National Wildlife Refuge Fund to cover payments, Congress is authorized to appropriate money to make up the difference. If the amount Congress appropriates is not enough, the units of local government receive a pro-rata share

3.4 Management of existing lands and acquired lands will be administered under the Rainwater Basin Wetland Management District's Comprehensive Conservation Plan. This plan was approved in 2007 with a 15-year revision time-frame.

3.5 The Strategic Habitat Conservation model outlined in Chapter 5 of the EA provides a framework for biological planning, conservation design, conservation delivery, and monitoring and research.

## Letter #4—Nebraska Game and Parks Commission (page 1 of 2)

### Comments on the USFWS's Rainwater Basin Wetland Management District Preliminary Project Proposal

Submitted by the Nebraska Game and Parks Commission  
June 30, 2011

Contact person:  
Jim Douglas, Deputy Director  
P.O. Box 30370  
Lincoln, NE 68503  
Phone: (402) 471-5436  
e-mail: [jim.douglas@nebraska.gov](mailto:jim.douglas@nebraska.gov)

The Nebraska Game and Parks Commission ("Commission") appreciates the opportunity to comment on the U.S. Fish and Wildlife Service's Draft Environmental Assessment and Land Protection Plan for the proposed Rainwater Basin Wetland Management District Expansion dated August 2011.

Our Agency recognizes the international importance of Rainwater Basin wetlands in supporting millions of migratory waterfowl, shorebirds, and other waterbirds, including Whooping Cranes and Buff-breasted Sandpipers, both designated as Tier I species by the Nebraska Natural Legacy Project. Many of the bird species using Rainwater Basin wetlands are also indentified as being in need of conservation in the North American Waterfowl Management Plan, United States Shorebird Conservation Plan, North American Waterbird Conservation Plan, or the North American Landbird Conservation Plan. Rainwater Basin wetlands and their surrounding uplands also provide important habitat for resident wildlife and overall regional bio-diversity. These wildlife resources attract many hunters and wildlife watchers who spend time and money in the Rainwater Basin. In addition, Rainwater Basin wetlands have recently been demonstrated to provide important ground-water recharge and water quality benefits.

The Commission, along with the U.S. Fish and Wildlife Service, is a partner in the Rainwater Basin Joint Venture (RWBJV) that is working to achieve landscape conservation objectives for the Rainwater Basin. We have signed the existing RWBJV Implementation Plan, and are working closely with the RWBJV in updating the existing plan. We recognize the need to provide enough habitat in the right places and condition in order to meet plan objectives. The acreage targets proposed in the Draft Environmental Assessment are in line with the conservation needs of the Rainwater Basin. We believe that the focus on "round-out" acquisitions is appropriate and that this has the potential to increase management efficiency and capabilities. In addition, we recognize that numerous tools are needed to achieve conservation, and that both fee-title and easement acquisition are tools that should be available, along with other tools such as private lands projects and improved management, to meet both conservation and landowner needs.

### Service Response to Letter #4

4.1 Thank you for your comments. Your letter confirms that, together with our State partners, we are working in concert to protect those resources necessary for the use, benefit, and enjoyment of the people within these states and to those well beyond our borders.

**Letter #4—Nebraska Game and Parks Commission (page 2 of 2)**

We recognize local concerns about the amount of land under federal ownership in some counties, and the impact that this may have on local property taxes. We are willing to assist the Service in exploring ways to address this issue, as we have experience making in lieu of property tax payments to the local counties for Commission owned properties. However, the value that the conservation of wetlands can provide toward the overall quality of life, in generating tourism dollars, and contributing to groundwater recharge and water quality improvement should not be overlooked.

Finally, we recognize the need for intensive management of Rainwater Basin wetlands to achieve migratory waterbird habitat benefits. The Commission also supports management of associated uplands to benefit grassland songbirds and upland game birds, which also require periodic and at times intensive management activities. We will continue to partner with the Service and the RWBJV in the future to evaluate management effectiveness, and to make recommendations on ways to improve management of the wetlands and associated uplands.

**Letter #5—Nebraska Farm Bureau Federation (page 1 of 2)**

**Service Response to Letter #5**



**nebraska farm bureau federation®**  
 5225 S. 16th St., P.O. Box 80299, Lincoln, NE 68501 Phone: (402) 421-4400 FAX: (402) 421-4427

July 15, 2011

Ronnie Sanchez  
 Wetland Management District Manager  
 Rainwater Basin Wetland Management District  
 U.S. Fish and Wildlife Service  
 P.O. Box 8  
 Funk, NE 68940

Dear Mr. Sanchez,

I am writing on behalf of the members of the Nebraska Farm Bureau Federation (NEFB) to provide comment on the draft Environmental Assessment (EA) and Land Protection Plan (LPP) for the Rainwater Wetland Management District in Nebraska as proposed by the U.S. Fish and Wildlife Service (USFWS). NEFB is Nebraska's largest general farming organization and our members take great interest in issues affecting the financial and social well-being of Nebraska farm and ranch families and the rural communities supported by agricultural activities. For those reasons, our members located within the Rainwater Basin area have expressed great interest in the proposed expansion of the Rainwater Wetland Management District in Nebraska.

5.1 From a fundamental standpoint, NEFB policy opposes the basic tenants of the USFWS proposal to expand the Rainwater Basin Management District outlined in "Alternative B," the management alternative favored by USFWS. Under this alternative, USFWS is seeking to acquire an additional 9,177 acres of land via fee title acquisition. NEFB's organizational policy clearly opposes further expansion of federal land ownership. Alternative B also proposes that USFWS seek to secure another 5,000 acres of land through securing permanent conservation easements. NEFB policy also opposes conservation easements that extend into perpetuity.

5.2 The two methods proposed for expanded protection and restoration of wetlands pose multiple problems and concerns for farmers, ranchers, and other rural landowners residing within and outside the Rainwater Basin Wetland Management District. It is widely estimated that by 2050 agriculture will need to produce 100 percent more food than is grown today to feed a growing world population. Taking viable agricultural land out of production or limiting the land's food raising capacity by placing restrictions on the type of agriculture that can occur can have a major impact on the greater public good. This broader social consideration appears to be absent in the USFWS proposal but is of major concern to food producers. For this reason, many of the concerns that were raised by rural and agricultural interests about this USFWS proposal at the scoping meetings are valid.

**Local Economy**

5.3 Taking land out of agriculture production or changing the agriculture use does not equate to protection for local economies. While the proposal suggests that upland game and waterfowl hunting provides significant economic activity in the Rainwater Basin (roughly \$2.3 million annually), it is a relatively pedestrian amount when compared to the use of such land for agriculture, particularly in comparisons on scale. The \$2.3 million figure would appear to be equated across the roughly 22,000 acres of wetlands currently acquired by USFWS. Using simple math, 3,000 acres of dryland corn yielding 100 bu/acre at \$7.00/bu corn prices would generate roughly a \$2.1 million local economic impact. If it takes 22,000 acres of wetland to generate \$2.3 million in economic activity, but only 3,000 acres of working farmland

5.1 Thank you for your comments.

5.2 The Service agrees that agricultural production is vitally important to the nation, and feels conservation easements provide a viable partnership where agricultural production and wildlife conservation can coexist. The National Wildlife Refuge System Improvement Act provides clear direction to the Service to "plan and direct the continued growth of the System in a manner this is best designed to accomplish the mission of the System, and to increase support for the System and participation from conservation partners and the public."

5.3 The Service understands and recognizes the importance of agricultural production not only in local communities but the nation as a whole. The Service is mandated to provide habitat for and protect migratory bird species for the greater human environment. Although agricultural lands may produce more economic revenue than wildlife habitat, chapter 4 of the EA (Social Benefits) outlines the social benefits of wildlife habitat, many of which are difficult or impossible to assign dollar amounts to. These include groundwater recharge, flood control, increased water quality, sediment and nutrient entrapment, recreation, aesthetics, and the health and production of wildlife, all of which are important and necessary for the American public.

## Letter #5—Nebraska Farm Bureau Federation (page 2 of 2)

## Service Response to Letter #5

to generate \$2.1 million in economic activity, it is difficult to argue that taking or converting agricultural land to wetlands creates a better socioeconomic environment for local communities and economies. The USFWS proposal would obviously stifle this economic opportunity for an estimated 14,000 additional acres in the Rainwater Basin Wetland Management District.

**Property taxes**

Taking land off the local tax roll reduces revenues for local political subdivisions and can impact property taxes paid. USFWS notes that in 2009, the Refuge revenue-sharing payment to Rainwater Basin counties averaged only 32.3 percent of the full payment that would have been generated if such lands had been under private ownership. These reductions are meaningful to local counties and schools and should not simply be dismissed as acceptable losses associated with offsetting the social benefits related to wetland protection. To claim that land acquisition is beneficial in that it reduces the need for water and sewer services, local law enforcement and other local government costs associated with local communities demonstrates a lack of understanding of Nebraska's fundamental needs for economic growth and development in rural areas. Furthermore, the shortfall in property taxes paid due to government ownership most certainly falls back on rural property tax payers where political subdivisions are already challenged to make difficult decisions about financing the most basic of government services in rural areas, namely roads and schools.

For these reasons NEFB opposes USFWS proposed "Alternative B" that would place an additional 14,000 acres under ownership and control of the federal government. Having said that, we do believe there is merit in protection of wetlands that enhance waterfowl habitat. There are better ways to work collaboratively with local landowners that could accomplish wetland protection and enhancement without further federal land acquisition or the use of permanent conservation easements. As noted in the Draft Environmental Assessment, USFWS considered, but opted not to further study the concept of "Wetland Protection and Enhancements Through Partnerships." This proposal suggested development of a program similar to CRP that would pay landowners for protecting their wetlands from being altered or destroyed for a period of 10-years, with an opportunity for renewal. While USFWS dismissed this concept as not ensuring long-term wetland protection, a CRP type model, with the potential for a longer term contract, could present a reasonable alternative that eliminates many of the concerns surrounding federal land acquisition and permanent easements. Flexibility in land management is key not only for today, but into the future. USFWS would be well served to forego "Alternative B" and seek an alternative that protects agriculture as the foundation of the local economies, does not harm local tax bases or place greater tax burdens on local citizens, does not lock in "forever" type decisions about land management, and keeps land in the hands of private citizens.

We greatly appreciate your consideration of these comments.

Please feel free to contact Craig Head, NEFB State Director of Governmental Relations, at 402-421-4435, with any questions you may have.

Sincerely,



Keith Olsen  
President

CC: Senator Ben Nelson, Senator Mike Johanns, and Congressman Adrian Smith

5.4

5.4 Refuge revenue sharing funds are obtained from the net income the Service receives from products or privileges like timber sales, grazing fees, and right-of-way permit fees, which are deposited in the National Wildlife Refuge Fund for revenue sharing payments. If there is not enough money in the National Wildlife Refuge Fund to cover payments, Congress is authorized to appropriate money to make up the difference. If the amount Congress appropriates is not enough, the units of local government receive a pro-rata share. The Service respectfully disagrees that economic impact to local communities has been dismissed in the EA. The NEPA process is designed to analyze a proposed action and determine if significant impacts to the human environment exist. This analysis was explained thoroughly in Chapter 4 (Environmental Consequences) of the EA.

5.5

5.5 Thank you for your comments.

5.6

5.6 The Service does have a Partners for Fish and Wildlife Program that is active in the Rainwater Basin and can provide technical assistance and funding to landowners for conservation projects. This program is open to any willing landowner if acquisition is not an option for that landowner. Conservation easements (part of the proposed action) do keep land in the hands of private citizens and land on the local tax roles.

# Letter #6—Rainwater Basin Joint Venture



**Rainwater Basin Joint Venture**  
 2550 N Diers Ave, Suite L  
 Grand Island, NE 68803-1214  
 (308) 382-8172  
 Fax (308) 382-3688  
[www.rwbjv.org](http://www.rwbjv.org)  
 Andy Bishop, Coordinator  
 (308) 380-8691



## Service Response to Letter #6

Thank you for your comments.

July 13, 2011

Ronnie Sanchez  
 Rainwater Basin Wetland Management District  
 P.O. Box 8  
 Funk, Nebraska 68940

Dear Ronnie

The Rainwater Basin Joint Venture has worked closely with the U.S. Fish and Wildlife Service Region 6 Division of Planning to establish the goals and objectives outlined in the Draft Environmental Assessment and Land Protection Plan for the Rainwater Basin Wetland Management district. Acquisition of the fee title and easement acres described in this plan will contribute significantly to the public lands and long term conservation strategies outlined in the draft Implementation Plan for the Rainwater Basin Joint Venture and adopted by the Rainwater Basin Joint Venture Management Board.

Thank you for the opportunity to contribute to this plan.

Sincerely,

*Andy Bishop*

Andy Bishop

**Visit us on the web at [www.rwbjv.org](http://www.rwbjv.org)**

- |  |  |  |  |  |  |
|--|--|--|--|--|--|
| <b>Board members:</b>  | Matt Hogan<br>US Fish & Wildlife Service<br>Denver, CO     | Mel Taylor<br>Landowner<br>Milligan, NE                  | Steve Donovan<br>Ducks Unlimited Inc<br>Grand Island, NE | Pete Berthelsen<br>Pheasants Forever<br>Ebas, NE                       | Clora Erickson<br>Landowner<br>Robesgt, NE |
| Tim McCoy<br>NE Game & Parks Com<br>Lincoln, NE                          | Dr. Mace Hack<br>The Nature Conservancy<br>Omaha, NE       | Greg Reisdorf<br>Farm Service Agency<br>Lincoln, NE      | Bob Bettiger, Chairman<br>Landowner<br>Fairmont, NE      | Mike Ornen<br>NE Association of<br>Resource Districts<br>Davenport, NE | Ardell Epp<br>Landowner<br>Aurora, NE      |
| Britt Weiser<br>Natural Resources<br>Conservation Service<br>Lincoln, NE | Lynn Reynolds<br>Tri-Basin NRD, Alternate<br>Lexington, NE | David Parfley<br>Tri-Basin NRD, Alternate<br>Kearney, NE | Ken Feather<br>Upper Big Blue NRD<br>York, NE            |  |  |
| Steve Shaw<br>Upper Big Blue NRD<br>Dewese, NE                           |  |  |  |  |  |

## Letter #7—Nebraska Chapter, The Wildlife Society

### Service Response to Letter #7

Thank you for your comments.



#### Nebraska Chapter, The Wildlife Society

Excellence in Wildlife Stewardship Through Science and Education

June 30, 2011

Ronnie Sanchez  
U.S. Fish and Wildlife Service  
Rainwater Basin Wetland Management District  
P.O. Box 8  
Funk, NE 68940

Dear Mr. Sanchez,

The Nebraska Chapter of The Wildlife Society is submitting the following comments concerning the expansion of protection of wetlands in the Rainwater Basin Wetland Management District. The Nebraska Chapter is a professional organization of wildlife biologists that strives to develop and promote sound stewardship of wildlife resources and environments upon which wildlife and humans depend. One of our goals is to conserve the natural resources of Nebraska through advocacy based on scientific principles.

The Nebraska Chapter is in strong support of the proposed action of Alternative B which would increase the land acquisition goal currently at 24,000 acres to 38,177 acres within the Rainwater Basin Wetland Management District. We support the Service acquiring an additional 9,177 acres through fee title and 5,000 acres in conservation easements by working with willing landowners to restore and/or enhance wetland habitat within the basins. Managing upland grassland habitat adjacent to wetland acres is vital to maintaining functional wetland ecosystems, thus we support the inclusion of adjacent grasslands to wetlands obtained through fee title or conservation easement.

The wetlands within the Rainwater Basin Wetland Management District are well known as critical staging habitat for migrating cranes, waterfowl and shorebirds necessary for them to gain nutritional needs before continuing their journey to the breeding grounds. It has been documented that 329 species of birds have been sighted in the basins, including 41 species of shorebirds and 35 species of waterfowl. Protecting these wetland acres is extremely important in sustaining these populations along their migration routes and ameliorating further threats of production agriculture and drainage to these wetlands.

Thank you for allowing the Nebraska Chapter to provide feedback during the planning process on this very important issue. The Rainwater Basin is very important to the natural resources of Nebraska and the wildlife species that depend upon the region.

Sincerely,

Lucas Negus, President  
Nebraska Chapter-The Wildlife Society  
86502 Grove Lake Road  
Royal, NE 68773-0044  
(402) 893-2559



# Appendix E

## *Finding of No Significant Impact*

**U.S. Department of the Interior  
FISH AND WILDLIFE SERVICE  
Region 6, Denver, Colorado**

**FINDING OF NO SIGNIFICANT IMPACT**

**Rainwater Basin Wetland Management District Expansion**

Adams, Clay, Fillmore, Franklin, Gosper, Hall, Hamilton, Kearney, Phelps, Polk, Saline, Seward and York Counties, Nebraska

The U.S. Fish and Wildlife Service has completed the Environmental Assessment and Land Protection Plan, Rainwater Basin Wetland Management District Expansion. The Environmental Assessment evaluated two alternatives, including a No Action Alternative, and the subsequent environmental consequences of establishing the Rainwater Basin Expansion project.

Alternative B, the preferred alternative, was selected for implementation because it best meets the Service's mission goal to sustain fish and wildlife populations and to conserve a network of lands that provide their habitats. The Rainwater Basin Expansion project has been proposed to help protect wetlands and surrounding uplands from alteration or destruction. This proposal also would benefit the American public by providing wildlife, recreation, water quality, and flood control.

The following is a summary of anticipated environmental effects from implementation of the preferred alternative:

1. The Rainwater Basin Expansion project would provide for the protection, in perpetuity, of 14,177 additional wetland and upland areas within the Rainwater Basin Region of Nebraska. The Project would compliment the conservation work of the Rainwater Basin Joint Venture, Nebraska Game and Parks Commission, Natural Resource Conservation Service, National Fish and Wildlife Foundation, Ducks Unlimited, Pheasants Forever, The Nature Conservancy and several other partners.
2. Waterfowl Production Areas having portions of their hydric footprint in private ownership would be increased in size to include the entire wetland, allowing for management of the hydrology and vegetation. This improved management should reduce overall management costs and provide increased benefits to many migratory bird species and their habitats.
3. Waterfowl nutritional needs will be better met when more wetlands with full Service ownership can be managed to provide natural foods. When fully implemented, migrating birds will receive approximately 43% of the caloric needs from natural foods, versus the 14% they are currently receiving.
4. The potential and extent of avian disease outbreaks such as avian influenza will decrease as more wetlands with suitable wetland habitat are available to disperse high populations of birds over a larger area. This provides benefits not only to wildlife populations but overall human health as well.

5. Ownership will allow altered or destroyed wetlands to be restored, increasing the acres of wildlife habitat, public recreation, and environmental services—include flood control and water quality.
6. The Service would manage the acquired lands as Waterfowl Production Areas, with the wetland managed for migratory waterfowl and shorebirds and the upland for grassland nesting birds.
7. Conservation easements purchased on private land would not change the landowners' rights to manage public access to their properties. Private landowners would retain full control over their property access rights, including allowing or restricting hunting and fishing on their lands, under the proposed easement program.
8. The proposed action would affect the location and distribution, but not the rate or density, of human population growth. Positive effects may occur from increased public wildlife viewing and hunting opportunities. Open space consisting of native prairie may enhance property values on adjoining lands as people begin to seek undeveloped lands in the future.
9. Approximately 9,177 acres will be removed from local property tax roles. The Refuge Revenue Sharing Act will provide some economic relief to local governments. However, recent payments from the National Wildlife Refuge Fund have been below what is currently due. The difference between what is paid by the Revenue Sharing program and what is due, does result in lower revenue for local governments, but substantive social benefits are provided by public lands to local communities and economies. These include, but are not limited to: flood control, groundwater recharge, increased water quality, sediment or nutrient entrapment, recreation, aesthetics, and the health and production of wildlife.

As part of the public scoping process associated with this action, comments were solicited from the public through news releases and public meetings. Open houses were held at Holdrege and Clay Center. Public comments were taken to identify issues to be analyzed for the proposed project. Approximately 39 landowners, citizens and elected representatives attended the meetings. Everyone was given an opportunity to express their ideas and concerns. During the review of the draft EA and LPP, the Service received 7 letters from agencies, organizations, and other entities, 58 general public comments and 3 phone calls. All comments were received, reviewed and incorporated into the administrative record and Environmental Assessment.

In addition, the Service's field staff has contacted local government officials, other public agencies, 21 Native American tribes with aboriginal interest in the area, and several conservation groups.

Thus, this EA has taken a thorough look at the environmental impacts to inform the public and ourselves about the consequences of the proposed action. Environmental consequences will be beneficial to all types of migratory birds, grassland wildlife, water quality, flood control. The proposal however does recognize that socioeconomic impacts will include the loss of property tax revenue to the counties. The social and environmental benefits provided by restored

wetlands are expected to offset economic losses associated with converting marginal cropland to wetland habitat.

In determining whether this project is a major action significantly affecting the quality of the human environment, we looked at both the context and intensity of the action (40 CFR § 1508.27, 40 CFR § 1508.14) as required by NEPA. In terms of context, the proposed action will occur in south-central Nebraska but we have evaluated whether it will have effects on the human environment on a broader scale. The project will be implemented over time, dependent upon the Fish and Wildlife Service's ability to obtain the funding needed for acquisitions from willing sellers.

The 14,177 acres identified for acquisition and protection are representative of low production lands that once were wetlands but were altered or converted to low production farmland. Acquisitions will focus on these types of lands that are for sale from willing sellers. High-production cropland will not be targeted for acquisition because they do not meet the goal of the Rainwater Basin Expansion Project.

Because the human environment is interpreted by the National Environmental Policy Act to mean the natural and physical environment and the relationship of people with that environment (40 CFR § 1508.14), in addition to our thorough analysis of physical environmental effects, we carefully assessed the manner in which the local people relate to the environment in the Rainwater Basin. Economic or social effects are not intended by themselves to require the preparation of an environmental impact statement (40 CFR § 1508.14). The location of the proposed action is largely rural and dominated by agricultural industries, mainly farming. Comments of the action were mostly for the project. However, landowners from one local area were clearly opposed to the action based on loss of property taxes to the counties, while a large group made up primarily of urban citizens and conservation groups, expressed support toward preserving one of Nebraska's unique resource areas.

Therefore, in consideration of the fact that the Fish and Wildlife Service's conservation approach has a proven tract record of effectiveness, the project requires voluntary participation to accomplish goals of the Service while providing socio-economic benefits to the communities, the compelling science in support of the project, and my review of the information contained in the supporting reference, I have determined that expanding acquisition within the Rainwater Basin by 14,177 acres is not a major federal action that would significantly affect the quality of the human environment within the meaning of Section 102(2)(C) of the National Environmental Policy Act of 1969.

The Finding of No Significant Impact (FONSI) and supporting assessment will be available to the public. Copies of the Environmental Assessment are available for all affected landowners, agencies, private groups, and other interested parties.

The FONSI, Environmental Assessment, and other supporting documents are on file at the U.S. Fish and Wildlife Service, Refuges, Division of Planning, P.O. Box 25486-DFC, Denver, Colorado 80225 (telephone 303-236-4345). They are available for public inspection upon request.

**Supporting Reference**

U.S. Fish and Wildlife Service. 2011. *Land Protection Plan and Environmental Assessment, Rainwater Basin Expansion Project*, Denver, Colorado.



Regional Director, Region 6  
U.S. Fish and Wildlife Service

9/1/11  
Date

<sup>1</sup> 40 CFR § 1508.27 "Significantly" as used in NEPA requires considerations of both context and intensity (a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant; and (b) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action.

<sup>1</sup> 40 CFR § 1508.14 "Human environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. (See the definition of "effects" (40 CFR § 1508.8).) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment

# Appendix F

## *Environmental Action Statement*

**U.S. Fish and Wildlife Service  
Region 6  
Denver, Colorado**

### **ENVIRONMENTAL ACTION STATEMENT**

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and have determined that the action of increasing the acquisition authority of the Rainwater Basin Wetland Management District:

- is a categorical exclusion as provided by 516 DM 2, Appendices 1 and 2, and 516 DM 6, Appendix 1. No further documentation will be made.
- is found not to have significant environmental effects as determined by the attached Finding of No Significant Impact and Environmental Assessment.
- is found to have special environmental conditions as described in the attached environmental assessment. The attached Finding of No Significant Impact will not be final nor any actions taken pending a 30-day period for public review [40CFR 1501.4(e)(2)].
- is found to have significant effects and, therefore, a notice of intent will be published in the *Federal Register* to prepare an environmental impact statement before the project is considered further.
- is denied because of environmental damage, Service policy, or mandate.
- is an emergency situation. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

Other supporting document:

*Land Protection Plan and Environmental Assessment, Rainwater Basin Wetland Management District Expansion*

*Meghan Laugel*  
acting Assistant Regional Director  
National Wildlife Refuge System, Region 6

8/31/11  
Date

*Steph Hunt*  
Regional Director, Region 6  
U.S. Fish and Wildlife Service

9/1/11  
Date



# Appendix G

## *Environmental Compliance Certificate*

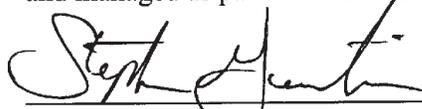
### U.S. FISH AND WILDLIFE SERVICE, REGION 6 ENVIRONMENTAL COMPLIANCE CERTIFICATE

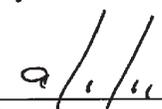
PROJECT: **Rainwater Basin Wetland Management District Expansion**

STATE: **Nebraska**

ACTION (indicate if not applicable)	DATE
NEPA (NATIONAL ENVIRONMENTAL POLICY ACT)(INDICATE ONE)	
Categorical Exclusion.....	N/A
Environmental Assessment/Finding of No Significant Impact.....	8/29/2011
Environmental Impact Statement/Record of Decision.....	N/A
Executive Order 11593, Protection of Historical, Archaeological, and Scientific Properties.....	8/5/2011
Executive Order 11988, Floodplain Management.....	8/5/2011
Executive Order 11990, Protection of Wetlands.....	8/5/2011
Executive Order 12372, Intergovernmental Review of Federal Programs.....	8/5/2011
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.....	8/5/2011
Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System.....	8/5/2011
Endangered Species Act, Section 7.....	7/12/2011
Coastal Zone Management Act, Section 307.....	N/A
Uniform Relocation Assistance and Real Property Acquisition Policies Act.....	8/5/2011
Level I Contaminants and Hazardous Waste (Secretarial Order 3127: 602DM2).....	8/5/2011

I hereby certify that all requirements of the law, rules, and Service regulations or policies applicable to planning for the above project have met with compliance. I approve the increase in acquisition authority for the Rainwater Basin Wetland Management District to be administered and managed as part of the National Wildlife Refuge System.

  
\_\_\_\_\_  
Regional Director, Region 6  
U.S. Fish and Wildlife Service

  
\_\_\_\_\_  
Date

## STATEMENT OF COMPLIANCE

The following Executive Orders and legislative acts have been reviewed as they apply to the increase in acquisition authority for the Rainwater Basin Wetland Management District:

1. **Executive Order 11593. Protection of Historical, Archaeological, and Scientific Properties.** The Regional Historic Preservation Officer has determined that the acquisition of lands in fee-title or easements within the Rainwater Basin Wetland Management District is an undertaking under section 106 of the National Historic Preservation Act but has no potential to adversely affect historic properties. In fact, the project has the potential to protect cultural resources. If, in the future, the Service engages in surface disturbing activities or grants a special permit for the landowner under the easement, section 106 may be relevant at that time. If so, the Service will take the necessary steps to address any historical or archaeological issues.
  
2. **Executive Order 11988. Floodplain Management.** No structures that could be damaged by or that would significantly influence the movement of floodwater are planned for construction by the Fish and Wildlife Service on fee-title or easements acquired as part of this project.
  
3. **Executive Order 11990. Protection of Wetlands.** This action is consistent with protection of existing wetland resources from incompatible activities and thereby complies with this executive order.
  
4. **Executive Order 12372. Intergovernmental Review.** The Service has discussed the proposal to increase in acquisition authority for the Rainwater Basin Wetland Management District with landowners; conservation organizations; other federal agencies; tribal, state, and county commissioners; and other interested groups and individuals.  
  
At the federal level, the Service staff has coordinated with the U.S. Department of Agriculture (Natural Resources Conservation Service and Farm Service Agency), U.S. Bureau of Reclamation, and U.S. Army Corps of Engineers. At the state level, Governor Heineman's office; U.S. Senators Ben Nelson and Mike Johanns; U.S. Congressional Representatives Adrian Smith and Jeff Fortenberry; and the Nebraska Game and Parks Commission have been notified of this proposed action and given the opportunity to review the Environmental Assessment. In addition, the Service has provided information to twenty-one Tribes with potential interest in this project.
  
5. **Executive Order 12898. Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.** Increasing the acquisition authority of the Rainwater Basin Wetland Management District will not have a disproportionately high or adverse human health or environmental effect on minority or low-income populations. Therefore, this action complies with this Executive Order.
  
6. **Executive Order 12996. Management and General Public Use of the National Wildlife Refuge System.** The public has been invited to participate in the planning process and has

been very engaged. The Service held two public scoping meetings; and released the draft environmental assessment and land protection plan for forty-five days to get input on the in the project. Approximately 100 comments have been received from the public. The public's issues and comments have been incorporated into the Environmental Assessment and a copy of the final document will be sent to all interested landowners, agencies, private groups, and other parties. All future management of acquired lands will be done in accordance the 2007 Rainwater Basin Wetland Management District Comprehensive Conservation Plan.

7. **Endangered Species Act, section 7.** An internal section 7 consultation concluded the proposed action would have a 'May affect, but is not likely to adversely affect species/modify critical habitat' on listed species within the acquisition project area.
8. **Coastal Zone Management Act.** Due to the location of the project area, compliance of this Act was determined not to be needed.
9. **Uniform Relocation Assistance and Real Property Acquisition Policies Act.** Current occupants of those lands involved in a fee-title purchase would be eligible for relocation services. The Service would cover relocation expenses based on the guidelines of the Relocation Handbook, 49 CFR part 24, and the Uniform Act. No relocation assistance will be needed or real property acquisition will occur on easement purchases.
10. **Secretarial Order 3127. Contaminants and Hazardous Waste.** A Level 1 pre-acquisition contaminant survey will be completed prior to the purchase of any easement.

I hereby certify that the Service has complied with all requirements of law, rules, or regulations applicable to pre-acquisition planning for the above project. I approve the increase in acquisition authority for the Rainwater Basin Wetland Management District and the subsequent acquisition of up to 9,177 acres in fee-title and up to 5,000 acres of easements from willing sellers:



Regional Director, Region 6  
U.S. Fish and Wildlife Service

2/1/11  
\_\_\_\_\_  
Date



# Appendix H

## Director's Approval



### United States Department of the Interior



#### FISH AND WILDLIFE SERVICE Mountain-Prairie Region

IN REPLY REFER TO:  
NWRS/Planning/RWB  
Mail Stop 60138

MAILING ADDRESS:  
P.O. Box 25486, DFC  
Denver, Colorado 80225-0486

STREET LOCATION:  
134 Union Boulevard  
Lakewood, Colorado 80228-1807

SEP 01 2011

#### Memorandum

To: Director

From: Regional Director, Region 6

Subject: Transmittal of Decision Document – Increasing the Acquisition Authority of the Rainwater Basin Wetland Management District

The Decision Document to increase the acquisition authority for the Rainwater Basin Wetland Management District, in south-central Nebraska has been approved. With approval of this project, the Service, will be able to purchase up to an additional 9,177 acres in fee-title and up to 5,000 acres of conservation easements in the Rainwater Basin.

In order to strategically conserve critically important migratory bird habitat, the Service has used data on the energetic needs and number of bird-use days in the Rainwater Basin to estimate that migratory waterfowl need a total of 15.6 billion Kcal (kilocalories) during their stay in the region, consisting of both natural and agricultural sources. This project is designed to increase the amount of available energy for waterfowl from natural, nonagricultural foods from 2.1 billion Kcal to 4.4 billion Kcal, or 28 percent of their diet. Working collaboratively with partners, the Service has examined wetland acres in private ownership that may hamper the ability to manage wetlands owned by the Service that could provide these necessary nutrient demands. Taking these items into consideration the Service, has determined that an additional 9,177 acres of wetlands and associated upland buffers need to be purchased in fee-title and 5,000 acres of conservation easements. Fee-title acquisition will focus on two types of wetland properties. The primary focus will be on portions of privately owned wetland 'round outs' that share a boundary with wetlands already owned by the Service. The secondary focus will be on large wetlands that can serve as a core wetland within a complex of smaller privately owned wetlands.

Attached are the following documents, in accordance with land acquisition planning requirements, submitted for the Director's concurrence.

1. Environmental Assessment
2. Finding of No Significant Impact
3. Environmental Compliance Certificate
4. Environmental Action Statement
5. Land Protection Plan
6. Realty Feasibility Report

For fee-title purchases, an Engineering Assessment will be completed on a case-by-case basis as we proceed with the pre-acquisition process with willing sellers. A Conceptual Management Plan was not completed, because all lands will be managed in accordance to the Rainwater Basin Wetland Management District Comprehensive Conservation Plan approved in 2007.

#### Attachments



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Washington, D.C. 20240



In Reply Refer To:  
FWS/NWRS/049681

JUL 10 2012

### Memorandum

To: Regional Director, Region 6

From: Director *William A. Arns*

Subject: Approval to Proceed with Publication and Distribution of the Final Planning Documents for the Expansion of the Rainwater Basin Wetland Management District, Nebraska

I approve your request dated September 1, 2011, to expand the acquisition boundary of the Rainwater Basin Wetland Management District in south-central Nebraska by 14,177 acres.

The decision package you submitted for my consideration demonstrates the application of Strategic Habitat Conservation and uses spatially explicit decision support tools for targeting conservation delivery. It also contains an Environmental Assessment, Finding of No Significant Impact, and other related documents indicative of detailed planning. These documents comply with the requirements of the Director's land acquisition planning procedures memo dated August 11, 2000.

This project will preserve the ecological integrity of the Rainwater Basin by maintaining and enhancing the hydrology, flora, and fauna of wetlands, including the recovery of threatened and endangered species; and will help to further the Service's efforts in achieving the mission of the National Wildlife Refuge System.

I congratulate you on a job well done!

Attachments



# Appendix I

## *Section 7 Biological Evaluation*

**INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM**  
**For**  
**Issuance and Implementation of the Land Protection Expansion Project for the**  
**U.S. Fish and Wildlife Service**  
**Rainwater Basin Wetland Management District**

**Originating Person: Ronnie Sanchez**  
**Jeff Drahota**  
**Telephone Number: (308) 263-3000**  
**Date: June 7, 2011**

- I. Region:** 6
- II. Service Activity (Program):** Rainwater Basin Wetland Management District (WMD), Rainwater Basin Expansion Project, Land Protection Plan (LPP).
- III. Pertinent Species and Habitat:**
- A. Listed species and/or their critical habitat within the action area:**  
whooping crane (E), piping plover (T), Interior least tern (E)
- B. Proposed species and/or proposed critical habitat within the action area:**  
none
- C. Candidate species within the action area:**  
none
- IV. Geographic area or station name and action:**  
Rainwater Basin Wetland Management District  
Issuance and Implementation of the LPP for the Rainwater Basin WMD
- V. Location: (map attached)**
- A. Ecoregion number and name:** Platte/Kansas Ecoregion
- B. County and State:** Phelps County, Nebraska. The Rainwater Basin WMD encompasses 13 counties in south-central Nebraska.
- C. Distance and direction to nearest town:** The Rainwater Basin WMD headquarters is located in Funk, Nebraska.
- D. Species/habitat occurrence:**
- Whooping crane: The Rainwater Basin WMD is a key stopover site for this species migrating through the Central Flyway to their breeding area in the Northwest Territories in the spring and their wintering area on Aransas NWR in the winter.

**Piping plover:** The piping plover breeds and forages along river channels and nest on sparsely vegetated sandbars. It also breeds on large, alkaline lakes. The piping plover may be an uncommon visitor during the migration period, but has not been documented to nest on Rainwater Basin wetlands.

**Interior Least tern:** The Interior least tern breeds and forages along river channels and nests on sparsely vegetated sandbars. Although sightings are uncommon, it has been documented using Rainwater Basin wetlands during the spring and fall migrations. The majority of this species' habitat use in Nebraska centers on the major Riverine habitats such as the Missouri River, Platte River, Niobrara River, and Loup River.

## **VI. Description of proposed action:**

The U.S. Fish and Wildlife Service (Service) is proposing to expand the number of acres that it can own in fee title or hold in easements. Currently, the Service has been authorized to purchase 24,000 acres of habitat within the Rainwater Basin region. To date, 22,023 acres have been acquired and an additional 4,505 acres have been gifted, primarily from other Federal agencies. The Service proposes to strategically acquire an additional 9,177 acres in fee title and 5,000 acres in conservation easements. All purchases would be from willing sellers.

Fee-title acquisition would focus on lands that meet one of two criteria: wetland portions that adjoin properties already partially held in fee title by the Service and larger semi-permanent wetlands located within a wetland complex of smaller seasonal wetlands.

Conservation easements would be purchased on privately owned property containing smaller wetlands. The easements would protect the wetlands from being drained or filled. Surrounding upland buffer areas under easement would be planted with native grasses and protected from commercial and residential development, although haying and grazing would be allowed.

Acquired lands would be managed by the Rainwater Basin Wetland Management District, as described in a 2007 Comprehensive Conservation Plan.

## **VII. Determination of effects:**

### **A. Explanation of effects of the action on species and critical habitats in Items III. A, B and C:**

**Whooping crane:** Implementing the LPP will increase the acres of available habitat for this species. In fact, the increase in acquisition authority will have a beneficial effect by increasing the acres of available feeding and loafing habitat for this species.

Interior least Tern/  
Piping plover:

Implementing the LPP is not thought to have detrimental effects on either the Interior least tern or piping plover. In fact, the increase in acquisition authority will have a beneficial effect for these species by protecting additional migratory habitat for these species. The continued preservation and management of WPAs, especially grazing management, may increase this species use of WPAs.

**B. Explanation of actions to be implemented to reduce adverse effects:**

None are necessary. All actions delineated in this LPP are thought to follow and be in accordance with provisions of protection and restoration plans for several species, as delineated by the Service and other federal and State agencies. The WMD staff is well acquainted with provisions that would be invoked and be put into effect to protect federally listed species and species of special concern from any public use or management action by WMD staff or visitors to the WMD.

**VIII. Effect determination and response requested:**

**A. Listed species/designated critical habitat:**

Determination

Response Requested

**May affect, not likely to adversely affect species/adversely modify critical habitat**

Whooping Crane

Concurrence

Least Tern

Concurrence

Piping Plover

Concurrence

  
 \_\_\_\_\_  
 Jeff Drahota, Wildlife Biologist

6/10/2011  
 Date

  
 \_\_\_\_\_  
 Ronnie Sanchez, Project Officer

6/10/2011  
 Date

**IX. Reviewing ESO Evaluation:**

A. Concurrence  Nonconcurrence \_\_\_\_\_

B. Formal Consultation Required \_\_\_\_\_

C. Conference Required \_\_\_\_\_

D. Informal Conference Required \_\_\_\_\_

  
 \_\_\_\_\_  
 Nebraska Field Supervisor  
 Ecological Services  
 Grand Island, Nebraska

7/12/2011  
 Date

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