

## Appendix A

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*Northern harrier*

# Species and Habitats of Conservation Concern at Montezuma National Wildlife Refuge



## Resources of Concern

Given the multitude of purposes, mandates, policies, regional, and national plans that can apply to a refuge, there is a need to identify the resources of concern and then prioritize those resources that the refuge is best suited to focus on in its management strategies. The comprehensive list of resources of concern (table A.1) outlined in this section was derived from those resources identified in the Habitat Management Plan (USFWS 2008) and updated with more recent information available during the development of this draft Comprehensive Conservation Plan (CCP).

Table A.1. Comprehensive List of Resources of Concern for Montezuma NWR.

Species*	Seasons on Refuge <sup>1</sup>	Federal T&E <sup>2</sup>	New York T&E <sup>3</sup>	USFWS BCC Region 5 <sup>4</sup>	USFWS BCC National <sup>4</sup>	BCR 13 <sup>5</sup>	Partners in Flight <sup>6</sup>	Shorebird Plan-Atlantic Flyway <sup>7</sup>	Waterbird Plan <sup>8</sup>	Waterfowl Plan <sup>9</sup>	NY Comprehensive Wildlife Conservation Strategy Priorities <sup>10</sup>	NY NHP S Rank
<b>WATERBIRDS</b>												
American bittern	B-U, M-O			X		H			H		X	
Black-crowned night heron	B-U, M-U					M			M		X	
Black tern	B-U, M-U		E			M			M		X	S2
Common moorhen	B-C, M-C								M			
Common tern	B-O, M-O		T			H			L		X	
King rail	B-R, M-R		T			H	IB		H		X	
Least bittern	B-O, M-O		T	X		M			H		X	
Pied-billed grebe	B-C, M-C		T	X		M			H		X	S3
Sora	B-U, M-U								H			
Virginia rail	B-C, M-C, W-R					M			M			
<b>WATERFOWL</b>												
American black duck	B-C, M-A, W-C					H H	IB			H (H)	X	
Blue-winged teal	B-C, M-C					M				MH (ML)		
Canada goose Atl/SJBP	M-A, W-C					H H				(H)	X	
Canvasback	B-R, M-C, W-R					H					X	
Common goldeneye	M-U					H H						
Common merganser	M-C, W-U					M				L (L)		
Greater scaup	M-C					H				(H)	X	
Green-winged teal	M-C, B-O									ML		

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										(ML)		
Hooded merganser	M-C, B-U, W-O									H (L)		
Lesser scaup	M-C					H H				(H)	X	
Long-tailed duck	M-R					H H					X	
Mallard	M-A, B-C, W-C					M				H (M)	X	
Northern pintail	M-C, B-O					H				M (M)	X	
Redhead	M-C, B-O					M						
Ruddy duck	M-C, B-O										X	
Tundra swan	M-C, W-C					H				(H)		
Wood duck	M-C, B-C					H				H (H)	X	
<b>SHOREBIRDS</b>												
American golden plover	M-U					H		M C			X	
American woodcock	M-C, B-C					H	IA	HC			X	
Black-bellied plover	M-U					M		M C			X	
Buff-breasted sandpiper	M-O			X	X	H		HC			X	
Dunlin	M-C				X	M		M C			X	
Greater yellowlegs	M-C					M		HC			X	
Hudsonian godwit	M-R			X	X	M		M C			X	
Least sandpiper	M-C					M		M C				
Lesser yellowlegs	M-C			X	X			LC				
Pectoral sandpiper	M-C					M		LC				
Red knot	M-U			X	X	M		M C			X	
Sanderling	M-U					M		M C			X	
Semipalmated sandpiper	M-C			X	X	M		M C			X	
Short-billed dowitcher	M-C			X	X	H		HC			X	
Solitary sandpiper	M-U			X	X	H		M C				

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Upland sandpiper	M-R, B-R		T	X	X	M	IB	HC			X	
Whimbrel	M-R			X	X	M		HC				
Wilson's phalarope	M-U					M		HC				
Wilson's snipe	M-U, B-U					M		M C				
<b>LANDBIRDS</b>												
Bald eagle	B-C, M-C, W-C		T	X	X						X	S2 S3
Baltimore oriole	M-C, B-C					M	II A					
Bay-breasted warbler	M-C			X	X	M						
Black-billed cuckoo	M-O, B-O					H	II A				X	
Black-throated blue warbler	M-C					M						
Blue-winged warbler	M-U, B-O			X	X	H	IB				X	
Bobolink	M-U, B-U					M	II A				X	
Brown thrasher	M-O, B-O					H					X	
Canada warbler	M-U			X	X	M	IB				X	
Cerulean warbler	M-C, B-C		S C	X	X	H H	IB				X	
Chimney swift	M-U, B-U					M						
Common nighthawk	M-O										X	
Cooper's hawk	M-U, B-U, W-U		S C								X	
Eastern meadowlark	M-U, B-R, W-R					M					X	
Field sparrow	M-U, B-U, W-R					H	II A					
Golden-winged warbler	M-O			X	X	H H	IB				X	
Grasshopper sparrow	M-R, B-R					M	II C				X	
Henslow's sparrow	M-R, B-R		T	X	X	H H	IB				X	
Horned lark	M-O, B-O, W-O		S C								X	
Long-eared owl	M-R, W-R										X	
Northern flicker	M-C, B-C, W-U					M						

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Northern goshawk	M-R,W-R										X	
Northern harrier	M-C, B-U, W-U		T			M					X	S3
Osprey	M-C, B-C										X	
Prairie warbler	M-R			X	X	M						
Peregrine falcon	M-O		E	X	X						X	
Prothonotary warbler	M-R, B-R				X	M	IB				X	
Red-headed woodpecker	M-O			X	X	M	IB				X	
Red-shouldered hawk	M-O		S C								X	
Rose-breasted grosbeak	M-C, B-C					M	II B					
Rusty blackbird	M-U			X	X	M					X	
Scarlet tanager	M-C, B-C					M	II A				X	
Sedge wren	M-R, B-R		T	X			II C				X	S3
Sharp-shinned hawk	M-U, B-U, W-U		S C								X	
Short-eared owl	M-R,W-R		E	X	X	M	IB				X	S2
Song sparrow	M-C, B-C, W-O					M						
Vesper sparrow	M-O, B-O		S C								X	
Whip-poor-will	M-R			X							X	
Willow flycatcher	M-C, B-C				X	M	IA				X	
Wood thrush	M-C, B-C			X	X	H	IA				X	
Yellow-breasted chat	M-R										X	
<b>MAMMALS</b>												
Eastern red bat											X	
Eastern small-footed bat											X	
Hoary bat											X	
Indiana bat		E	E								X	
River otter											X	
Silver-haired bat											X	
<b>AMPHIBIANS<sup>11</sup></b>												
Blue-spotted salamander											X	

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Common mudpuppy											X	
Jefferson salamander											X	
Western chorus frog											X	
<b>REPTILES</b>												
Spotted turtle			S C								X	
Wood turtle			S C								X	
<b>FISH</b>												
Lake sturgeon			T								X	
<b>INVERTEBRATES</b>												
Blue-tipped dancer												S1
<b>PLANTS</b>												
Golden dock			E									S1
Holly-leaved naiad			E									S1
<b>ECOLOGICAL COMMUNITIES</b>												
Floodplain forest												S2 S3
Inland salt marsh												S1

<sup>1</sup>Seasons on the refuge: B=Breeding, W=Wintering, M=Migration, A=Abundant, C=Common, U=Uncommon, O=Occasional, R=Rare

<sup>2</sup>Federal T&E = Federal Endangered Species List: T=Threatened, E=Endangered, C=Candidate

<sup>3</sup>State T&E = State of New York Threatened and Endangered Species List: T=Threatened, E=Endangered, SC=Special Concern

<sup>4</sup>U.S. Fish and Wildlife Service Division of Migratory Birds. Birds of Conservation Concern for Region 5 (Northeast) December 2008

<sup>5</sup>BCR 13 = Bird Conservation Region 13: Lower Great Lakes/St. Lawrence Plain. HH=Highest Priority, H=High Priority, M=Medium Priority (ACJV 2007).

<sup>6</sup>Partners in Flight Landbird Priorities for the Lower Great Lakes Plain (Dettmers and Rosenberg 2003). IA=High continental concern and high regional responsibility; IB=High continental concern and low regional responsibility; IIA=High regional concern; IIB=high regional responsibility; IIC=High regional threats

<sup>7</sup>Upper Mississippi Valley/Great Lakes Regional Shorebird Conservation Plan (de Szalay et al. 2000). HI=highly imperiled species; HC=species of high concern; MC=species of moderate concern; LC=species of low concern

<sup>8</sup>Upper Mississippi Valley/Great Lakes Watershed Conservation Plan. Priorities: HI=Highly Imperiled; H=High; M=Moderate; L=Low; NR=Not at Risk; TD=To be Determined

<sup>9</sup>North American Waterfowl Management Plan: Atlantic Coast Joint Venture Waterfowl Implementation Plan Revision, June 2005 Priorities: H=High; MH=Moderately High; M=Moderate; ML=Moderately Low; L=Low. Example: H(H) = Breeding (Nonbreeding).

<sup>10</sup>New York State Comprehensive Wildlife Conservation Strategy (2005). X=Species of greatest conservation concern

<sup>11</sup>Presence on refuge based on information from the New York State Amphibian and Reptile Atlas Project 1990-1999.

## Priority Resources of Concern

A focus of this CCP is to provide guidance in prioritizing management strategies for species and their associated habitats. The comprehensive list of resources of concern (table A.1) contains a large number of species with a broad array of habitat needs. To guide us in prioritizing this list and selecting focal species, we used criteria listed in the draft handbook for identifying refuge resources of concern and management priorities (USFWS 2009) as follows:

- Species were rejected if they cannot be supported by current or restorable refuge capabilities.
- Species were rejected if they do not respond well to management.
- Species were rejected if they do not represent the condition of larger natural communities.
- Species selected were listed in the most conservation plans for a particular habitat type.
- The BCR 13 plan and NY State listings (e.g., endangered, threatened, special concern, or species of greatest conservation need) were particularly useful.
- Only one species per habitat type and season was selected (all forest types were combined with two focal species assigned).

Table A.2. Focal Species by Habitat, Required Habitat Structure, and other Benefiting Species of Concern on Montezuma NWR.

Habitat Type	Focal Species	Habitat Structure	Other Benefiting Species of Concern
<b>Freshwater Emergent Wetlands</b>	American black duck	Shallow, emergent wetlands of reeds, sedges, pondweed, floating-leaved plants, that are rich in invertebrates (Longcore et al. 2000). Present on refuge year-round.	American bittern, black-crowned night heron, black tern, common tern, horned grebe, king rail, least bittern, Virginia rail, blue-winged teal, Canada goose Atl/SJBP, canvasback, common goldeneye, common merganser, greater scaup, green-winged teal, hooded merganser, lesser scaup, long-tailed duck, mallard, northern pintail, redhead, ruddy duck, tundra swan, bald eagle, northern harrier, osprey, peregrine falcon, short-eared owl, river otter, spotted turtle.
	Pied-billed grebe*	Semi-permanent hemimarsh (emergent vegetation and open water mix ~ 50:50) with water depth > 10 in. > 0.2 ha (0.5 acre). (Wires et al. 2010).	

Habitat Type	Focal Species	Habitat Structure	Other Benefiting Species of Concern
<b>Inland Mudflats/ Shallow Water</b>	Short-billed dowitcher	Mostly open water < 2 in. deep with some mixed emergent vegetation (de Szalay et al. 2000). At Montezuma, migrates through in April/May with a peak in the last two weeks of May, also migrates through in low numbers in July, and from August to September with a peak in the last week of August ( <a href="http://www.ebird.org">www.ebird.org</a> ).	Blue-winged teal, Canada goose Atl/SJBP, green-winged teal, mallard, northern pintail, American golden-plover, black-bellied plover, buff-breasted sandpiper, dunlin, greater yellowlegs, Hudsonian godwit, least sandpiper, lesser yellowlegs, pectoral sandpiper, red knot, sanderling, semipalmated sandpiper, short-billed dowitcher, solitary sandpiper, whimbrel, Wilson's phalarope, Wilson's snipe, bald eagle, peregrine falcon.
<b>Forest</b>	Cerulean warbler	In BCR 13, breed in lake plain bottomland and riparian forests characterized by sycamore, cottonwood, silver, and red maple. Also associated with mature, late-successional forests (ACJV 2007). The MWC is an important breeding area.	American black duck, black-crowned night-heron, common goldeneye, hooded merganser, wood duck, American woodcock, bald eagle, Baltimore oriole, bay-breasted warbler, black-billed cuckoo, black-throated blue warbler, brown thrasher, Canada warbler, Cooper's hawk, prothonotary warbler, rose-breasted grosbeak, red-headed woodpecker, red-shouldered hawk, rose-breasted grosbeak, rusty blackbird, scarlet tanager, sharp-shinned hawk, willow flycatcher, Indiana bat, silver-haired bat, spotted turtle, wood turtle, blue-spotted salamander, Jefferson salamander, river otter
	Wood thrush	Typically associated with mature, late successional forests. May prefer edges and forest patches in proximity to openings (ACJV 2007).	
<b>Scrub/Shrub</b>	Blue-winged warbler	Both upland and wetland old, brushy fields with a well-developed shrub component (ACJV 2007). Present on the refuge during migration and breeding seasons.	American black duck, American woodcock, Baltimore oriole, brown thrasher, field sparrow, golden-winged warbler, northern flicker, red-headed woodpecker, song sparrow, willow flycatcher, yellow-breasted chat spotted turtle, western chorus frog
<b>Grassland</b>	Short-eared owl	Present on the refuge in winter. Short-eared owls generally require large expanses of open land with low vegetation, such as grasslands or low-structured open shrublands, for hunting during winter (Holt and Leasure 1993). Vole abundance has been linked directly to habitat utilization (Dechant et al.1998).	Eastern meadowlark, grasshopper sparrow, Henslow's sparrow, horned lark, northern harrier, sedge wren, song sparrow, upland sandpiper, vesper sparrow, willow flycatcher, spotted turtle, western chorus frog

Habitat Type	Focal Species	Habitat Structure	Other Benefiting Species of Concern
	Bobolink	Fields > 25 acres with medium to low vegetation density, a 50:50 mix of grasses and forbs, very few shrubs (< 1 percent), overall vegetation height of 11 to 16 in., and leaf litter 1 to 2 in. (Morgan and Burger 2008). Present on the refuge during migration and breeding seasons.	

\*Four species were closely compared for marshbird breeding habitat: American bittern, least bittern, pied-billed grebe, and black tern. All of these species are listed in at least four of eight conservation plans/lists. All are listed in the New York State CWCS and the BCR 13 plan. Least bittern and black tern were not selected because they occur in low abundances in BCR 13 relative to other BCRs. The pied-billed grebe was selected because it is more easily detected and currently more abundant than the American bittern on the refuge so may be more useful as an indicator species for the entire group as all four species use similar habitats. Also, the pied-billed grebe is believed to be more vulnerable to climate change than the American bittern so monitoring this species may be more useful for monitoring climate change impacts on the refuge.

## High and Moderate Priority Habitat Types

Refuge management is most often focused on restoring, managing or maintaining habitats, or certain habitat conditions, to benefit a suite of plants and animals associated with a particular habitat. Under Montezuma NWR’s Habitat Management Plan (USFWS 2008), high and moderate priority habitats were identified based on several factors including: site capability, historic conditions, current vegetation, the prevalence of that habitat type across the landscape, and the conservation needs of wildlife associates. As part of this process limiting factors were also identified that affect the refuge’s ability to maintain these habitats (see table A.3).

Table A.3. High and Moderate Priority Habitats on Montezuma NWR in Priority Order.

High Priority Habitat Types	Reason for Selecting as a High Priority	Limiting Factors for Maintaining this Habitat
<b>Freshwater emergent marsh</b>	The refuge has over 4,000 acres of this habitat within 13 manageable impoundments. More than 600,000 migrating ducks and geese feed and rest in these areas annually. American and least bitterns, black tern, pied-billed grebe, and Virginia rail are priority species in BCR 13 that nest here. These are foraging areas for bald eagles and migrating waterfowl during drawdowns. Emergent marsh is the habitat type containing the most priority species listed in the BCR 13 plan. Emergent marsh is uncommon regionally and requires active management to maintain This habitat also provides valuable breeding ground for other wildlife and numerous ecological benefits.	Natural hydrology has been altered. Requires water level manipulation; controlling dense monotypic stands of cattails; affected by weather; requires maintenance of dikes and water control structures; inflow of water and undesirable species from canal system and contaminants are of concern. Requires muskrat control.
<b>Inland mudflats</b>	The refuge is identified as a critical inland area for shorebird migration including many BCR 13 priority species. Mudflats are uncommon	Requires water level manipulation to remove or prohibit vegetative growth. Other limiting factors include:

High Priority Habitat Types	Reason for Selecting as a High Priority	Limiting Factors for Maintaining this Habitat
	natural occurrences regionally but can be created in impoundments.	contaminants, invasive species, flooding and drought. Also requires maintenance of dikes and water control structures.
<b>Forested Wetlands*</b>	Supports native forest community and associated species including wood duck, cerulean warbler and other priorities within BCR 13. Riparian corridors provide good connectivity and important summer habitat for bats.	Hydrology has been altered. Invasive species, overbrowsing by deer, and water quality are concerns.
<b>Upland Forest*</b>	Supports several BCR 13, New York State CWCS, and other plans' priority species. Historically, clayplain and sandplain forest dominated the area. Nearly 95 percent of this habitat in the BCR has been lost to agriculture.	Invasive species and overbrowsing by deer.
<b>Scrub/Shrub*</b>	Supports several BCR 13, New York State CWCS, and other plans' priority species.	Invasive species, succession and contaminants are factors. Restoration may be a requirement in some cases. Active management is required to maintain in this intermediate stage.
<b>Grasslands*</b>	Supports several BCR 13, New York State CWCS, and other plans' priority species.	Requires intensive management to maintain in grassland condition. Invasive species, succession and contaminants are factors.

\*Vernal pools exist in some or all of these habitat types on the refuge. Vernal pools are ephemeral wetlands that fill annually from precipitation, runoff, and rising groundwater. Vernal pools are essential habitat for portions of the life cycles of many species and are indispensable to biodiversity, both locally and globally.

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