

Appendix 1. IWAP Implementation Committee Members in 2015

Table Appendix 1- 1. IWAP Implementation Committee Members in 2015

Name	Title	Affiliation	Plan Responsibilities
Dr. Dale Garner	Wildlife Bureau Chief	DNR Wildlife	Plan Director
Katy Reeder	Wildlife Action Plan Coordinator	DNR Wildlife	Plan Coordinator
Todd Bishop	Special Projects	DNR Wildlife	Statewide land conservation, wetlands
Dr. Steve Dinsmore	Professor of Natural Resource Ecology & Management (NREM)	Iowa State University, Iowa Ornithologist's Union	Chair, Bird Subcommittee
Bruce Ehresman	Wildlife Diversity Biologist	DNR Wildlife	Birds, wildlife diversity program
Marlene Ehresman	Director	Iowa Wildlife Center	Wildlife outreach, landscapes and habitats
Chris Ensminger	Supervisor	DNR GIS Section	GIS, mapping
Scott Gritters	Fisheries Biologist	DNR Fisheries	Aquatics (fish and mussels)
Mark Gulick	NW District Wildlife Supervisor	DNR Wildlife	Land Management, shallow lakes
Doug Harr	President	Iowa Audubon	Birds, wildlife diversity
Doug Helmers	Partners for Fish & Wildlife Director	US Fish & Wildlife Service	Private Lands, Birds
Dr. Karen Kinkead	Wildlife Diversity Program Manager	DNR Wildlife	Chair, Wildlife Working Group, wildlife diversity program manager
Dr. Robert Klaver	Cooperative Fish & Wildlife Research Unit Leader	USGS/ISU	Spatial analysis, wildlife research
Joe Larscheid	Fisheries Bureau Chief	DNR Fisheries	Aquatic species
Gregg Pattison	Private Lands Biologist – Partners for F&W	US Fish & Wildlife Service	Land Management, Private Lands
Scott Peterson	Central District Wildlife Supervisor	DNR Wildlife	Land Management
Dr. Jesse Randall	Extension Forestry Specialist, Associate Professor, NREM Dept	ISU Extension, Natural Resource Ecology & Mgmt	Forestry
Scott Rolfes	Natural Resource Specialist	US Army Corps of Engineers	Land management
Robert Schwartz	Director	Winnebago County Conservation	Land management
Mike Shannon	Regional Biologist	Ducks Unlimited	Waterfowl
Marvin Shirley	Member	Iowa Farmers Union	Agricultural systems, private lands

Name	Title	Affiliation	Plan Responsibilities
Dr. Keith Summerville	Associate Dean, College of Arts and Sciences	Drake University	Lepidoptera, mammals, herpetofauna
Monica Thelen	Federal Aid Coordinator, GIS Specialist	DNR Wildlife	GIS, mapping
Terry Van De Walle	Biologist	Stantec	Herpetofauna, wildlife surveys

Table Appendix 1- 2. IWAP Implementation Committee Working Groups and Subcommittees in 2015

Working Group	Chair	Subcommittees (Subcommittee Chair)
Wildlife	Dr. Karen Kinkead	Amphibian & Reptiles (Jeff LeClere) Birds (Dr. Stephen Dinsmore) Butterflies (Stephanie Shepherd) Dragonflies & Damselflies (Steve Hummel) Fish (Dr. Clay Pierce) Mammals (Vacant) Mussels (Dr. Kevin Roe) Terrestrial Snails (Dr. Kevin Roe)
Wildlife Habitat	Katy Reeder	Northeast (Scott Gritters) Northwest (Mark Gulick) Southeast (Vacant) Southwest (Vacant)
Adaptive Ecological Management	Pete Hildreth	
Education & Recreation	Peter Fritzell	
Climate Change	Katy Reeder	

Appendix 2. 2004 Advisory Group Meeting Attendees

Table Appendix 2- 1. Attendees at the IWAP Advisory Group meeting in 2004, and their titles and affiliations at that time

(In order to accurately display the representation at the forum, no updates have been made to this list to reflect name changes, retirements, or changes.)

Name - Last	Name- First	Affiliation	Title	Address
Anderson-Cruz	Jennifer	Natural Resources Conservation Service	Biologist	Des Moines, IA
Andrews	Ron	Iowa DNR Wildlife	Furbearer Specialist & Wildlife Diversity Program	Clear Lake, IA
Bishop	Richard	Iowa DNR Wildlife	ex-Wildlife Bureau Chief	Des Moines, IA
Bogenschutz	Kim	Iowa DNR Fisheries	Aquatic Nuisance Species Coordinator	Boone, IA
Bonneau	Don	Iowa DNR Fisheries	Fisheries Research Supervisor	Moines, IA
Brandrup	Mike	Iowa DNR Con & Rec	Division Administrator	Des Moines, IA
Brown	Larry	Ruffed Grouse Society	Representative	Radcliffe IA
Bruce	Angi	Iowa DNR Wildlife	District Wildlife Supervisor	Lewis, IA
Burk	John	National Wild Turkey Federation	Biologist	Fulton, MO 65251
Cancilla	Jodeane	MacBride Raptor Center		Cedar Rapids, IA
Christiansen	Scott	Prairie Edge Sustainable Forestry Cooperative		Edgewood, IA
Clark	Jane	Sierra Club	Chair	Des Moines, IA
Conover	Marion	Iowa DNR Fisheries	Fisheries Bureau Chief	Des Moines, IA
Deaver	Steve	Linn County Conservation Board	Resource Technician	Marion, IA
DeGeus	Dave	The Nature Conservancy	Director of Conservation Programs	Des Moines, IA
Dinsmore	James	Iowa Audubon	Representative	Ames, IA
Dolan	Robert	Iowa DNR Wildlife	District Wildlife Supervisor	Manchester, IA
Downing	John	Iowa State University	Professor	Ames, IA
Ehresman	Marlene	IA Natural Heritage Foundation	Program Planning Associate	Des Moines, IA
Ehresman	Bruce	Iowa DNR Wildlife	Wildlife Diversity Program Biologist	Boone, IA
Farrar	Eugenia	EEOB Iowa State University	Professor	Ames, IA
Flynn	Chris	Iowa DNR	Conservation Officer	Birmingham, IA
Ford-Shivvers	Diane	Iowa DNR Con & Rec	Asst. Div. Administrator	Des Moines, IA

Name - Last	Name-First	Affiliation	Title	Address
Francisco	Kim	Natural Resources Commission	Chair	Lucas, IA
Fritzell	Peter	Iowa DNR Wildlife	Assistant Biometrician	Boone, IA
Garner	Dale	Iowa DNR Wildlife	Wildlife Bureau Chief	Des Moines, IA
Gengerke	Tom	Iowa DNR Fisheries	District Fisheries Supervisor	Spirit Lake, IA
Gilbertson	Nancy	US Fish & Wildlife Service	Biologist	Prairie City, IA
Gilliam	Jay	Iowa Ornithologist's Union	Conservation Committee Chair	
Gosselink	Todd	Iowa DNR Wildlife	Wild Turkey Biologist	Chariton, IA
Griffin	Mike	Iowa DNR Wildlife	Mississippi River Coordinator	Bellevue, IA
Gritters	Scott	American Fisheries Society	President	Guttenberg, IA
Hall	Jeff	Representative Boswell's Staff	Staff member	Des Moines, IA
Hansen	Steve	Iowa Woodland Owners Association		Des Moines, IA
Harr	Doug	Iowa DNR Wildlife	Wildlife Diversity Coordinator	Boone, IA
Harson	Greg	Iowa DNR Enforcement	Conservation Officer	Little Rock, IA
Heiser	Neil	Iowa DNR Wildlife	District Wildlife Supervisor	Spirit Lake, IA
Hendricks	Ace	Woodland Growers		Ackworth, IA
Hey	Jane	Morningside College		
Hill	Spencer	Iowa Trappers Association	President	Kanawha, IA
Holland	Steve	Iowa DOT		Ames, IA
Howell	Daryl	Iowa DNR Parks	Senior Environmental Specialist	Des Moines, IA
Hummel	Steve	Ida County Conservation Board	Board Member	Lake View, IA
Johnson	Ann	IA Odonata Society	Vice-Chair	Norwalk, IA
Johnson	Chuck	Loess Hills Audubon	Representative	Sioux City, IA
Kane	Kevin	Iowa State University	GIS Facility Director	Ames, IA
Klaas	Erv	Iowa State University (retired)	Professor Emeritus	Ames, IA
Kline	Don	Iowa DNR Fisheries	Natural Resource Biologist	Brighton, IA
Koenig	Darwin	Iowa Audubon		Ankeny IA
Koford	Rolf	Iowa Coop Unit	Professor	Ames, IA
Lamb	Inger	IA Prairie Network, IA Native Lands	President	
Lampe	Richard	Biology Department Buena Vista University	Professor	Storm Lake, IA
Lancaster	Jennifer	Iowa DNR Enforcement	District Law Enforcement Supervisor	Manchester, IA
Larson	Chris	Iowa DNR Fisheries	Natural Resource Technician	Lewis, IA
LeClere	Jeff		Consultant	St Paul, MN

Name - Last	Name-First	Affiliation	Title	Address
Leopold	Rich	Iowa Environmental Council	Chair	Des Moines, IA
Little	Terry	Iowa DNR Wildlife	Wildlife Research Supervisor Wildlife Diversity Supervisor	Des Moines, IA
MacInroy	Mark	Iowa DNR Wildlife	Wildlife Diversity Technician	Boone, IA
Major	Annabelle	Iowa State University	Grad Student	Ames, IA
Moritz	Bob	Loess Hills Alliance	Chair	Sioux City, IA
Neumann	Kay	Iowa Rehabilitator's Association	President	Dedham, IA
O'Brien	Jason	Iowa NatureMapping	Prog. Coord.	Ames, IA
Olsen	Frank	Lepidopterist		
Otis	Dave	Iowa Cooperative Fish & Wildlife Research Unit	Professor	Ames, IA
Parmalee	Jeff	Simpson College	Professor	Indianola, IA
Poole	Kelly	Iowa Department of Transportation	Aquatic Ecologist	Ames, IA
Roberts	Steve	Iowa DNR - Wildlife	Biometrician	Boone, IA
Robinson	Rick	Iowa Farm Bureau Federation	Environmental Coordinator	West Des Moines, IA
Rovang	Rodney	US Park Service	Resource Manager	Harper's Ferry, IA
Sand	Duane	INHF		Norwalk, IA
Schlarbaum	Pat	Iowa DNR Wildlife	Wildlife Diversity Program Technician	Boone, IA
Schlict	Dennis		Biology Teacher	Center Point, IA
Schwager	Marty	Iowa Pork Producer's Association	Executive Director	Clive, IA
Skibbe	Jessica	Iowa State University	Grad student	Ames, IA
Skold	Steve	Safari Club International	Regional Rep.	West Des Moines, IA
Smith	Kelly	Iowa DNR Wildlife	Landowner Incentive Program Coordinator	Des Moines, IA
Sproul	Tim	Harrison County Conservation Board	Director	Woodbine, IA
Steffen	Chuck	The Wildlife Society	President	Ottumwa, IA
Suchy	Willie	Iowa DNR Wildlife	Deer Biologist	Chariton, IA
Sweet	Mike	US Fish & Wildlife Service	Biologist	Ft. Snelling MN
Sweet	Craig	Iowa Trappers Association		IA
Swinton	Rod	Iowa Tree Farm Committee		Waterloo, IA
Szcodronski	Kevin	Iowa DNR Parks	Bureau Chief	Des Moines, IA
VanDeWalle	Terry	EarthTech	Biologist	Waterloo, IA
VanWaus	Dave	Pheasants Forever	Regional Director	Colo, IA
Walkowiak	John	Iowa DNR Forestry	Bureau Chief	Des Moines, IA

Name - Last	Name-First	Affiliation	Title	Address
Weedum	Joe	Hawkeye Flyfishing Association	President	Altoona, IA
Whittlesey	Dave	National Wild Turkey Federation	Supervisor	Woodburn, IA
Wooley	Jim	Pheasants Forever	State Director	Chariton, IA
Zarwell	Rick	Iowa Audubon	Important Bird Area Coordinator	Lansing, IA
Zenner	Guy	Iowa DNR - Wildlife	Waterfowl Biologist	Clear Lake, IA
Ziemer	Kathleen	Butterfliz of Iowa		Des Moines, IA
Zohrer	Jim	E Resources, Inc.	Private Consultant	West Des Moines, IA

Appendix 3. List of Iowa Amphibians Evaluated by the IWAP.

Taxonomic order derived from: the Society for the Study of Amphibians and Reptiles Standard English and Scientific Names Document, which can be accessed at: <http://ssarherps.org/>

Iowa Status/Listing: **Iowa Status** refers to Species of Greatest Conservation Need (SGCN) status as determined through IWAP species conservation status assessments. **Iowa Listing** refers to Iowa Endangered, Threatened, or Special Concern Status (from Iowa Code Chapter 77) as of 2015. For up-to-date state listing information, please see the Threatened and Endangered Species Program page on the DNR website at www.iowadnr.gov

National Rank/Listing: **National Rank** refers to NatureServe Conservation Status Ranks. N1 = Critically Imperiled in Nation; N2 = Imperiled in Nation; N3 = Vulnerable in Nation; N4 = Apparently Secure in Nation; N5 = Secure in Nation. For additional definitions and explanation see Appendix 14. **National Listing** refers to federally Endangered or Threatened species.

Assessments of species conservation status undertaken as part of the IWAP are used to determine SGCN status only. Other information is provided as a reference. Updates to State Wildlife Action Plans, NatureServe National Ranks, Federal T&E Status, and State T&E Status are each independent processes, undertaken by different entities with differing timeframes. As such, the various listings or status ranks for a given species at a given point in time may not always appear to be in accord.

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
Order: Caudata				
Family: Ambystomatidae – Mole Salamanders				
1	Blue-spotted Salamander	<i>Ambystoma laterale</i>	SGCN Endangered	N5
2	Smallmouth Salamander	<i>Ambystoma texanum</i>	SGCN	N5
3	Eastern Tiger Salamander	<i>Ambystoma tigrinum</i>	SGCN	N5
Family: Proteidae – Mudpuppies and Waterdogs				
1	Common Mudpuppy	<i>Necturus maculosus</i>	SGCN Threatened	N5
Family: Salamandridae - Newts				
1	Eastern Newt	<i>Notophthalmus viridescens</i>	SGCN Threatened	N5
Order: Anura				
Family: Bufonidae – True Toads				
1	American Toad	<i>Anaxyrus americanus</i>		N5
2	Great Plains Toad	<i>Anaxyrus cognatus</i>	SGCN	N5
3	Fowler's Toad	<i>Anaxyrus fowleri</i>	SGCN	N5
4	Woodhouse's Toad	<i>Anaxyrus woodhousii</i>	SGCN	N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
Family: Hylidae – Cricket Frogs, Treefrogs, and Chorus Frogs				
1	Blanchard's Cricket Frog	<i>Acris blanchardi</i>	SGCN	N5
2	Cope's Gray Treefrog	<i>Hyla chrysoscelis</i>	SGCN	N5
3	Eastern Gray Treefrog	<i>Hyla versicolor</i>	SGCN	N5
4	Spring Peeper	<i>Pseudacris crucifer</i>		N5
5	Boreal Chorus Frog	<i>Pseudacris maculata</i>		N5
Family: Ranidae – True Frogs				
1	Crawfish Frog	<i>Lithobates areolatus</i>	SGCN Endangered	N4
2	Plains Leopard Frog	<i>Lithobates blairi</i>		N5
3	Bullfrog	<i>Lithobates catesbeianus</i>		N5
4	Green Frog	<i>Lithobates clamitans</i>		N5
5	Pickerel Frog	<i>Lithobates palustris</i>	SGCN	N5
6	Northern Leopard Frog	<i>Lithobates pipiens</i>	SGCN	N5
7	Southern Leopard Frog	<i>Lithobates sphenoccephalus</i>	SGCN	N5
Family: Scaphiophidae - Spadefoots				
1	Plains Spadefoot	<i>Spea bombifrons</i>	SGCN	N5

Data Deficient Species – Species evaluated by Reptile and Amphibian subcommittee for which insufficient information was available to conduct a conservation status assessment

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
1	Common Mudpuppy	<i>Necturus maculosus</i>	SGCN Threatened	N5
2	Plains Spadefoot	<i>Spea bombifrons</i>	SGCN	N5

Removed from Iowa Species List

Common Name	Scientific Name	Explanation
Western Chorus Frog	<i>Pseudacris triseriata</i>	There are no records of this species in Iowa

Appendix 4. List of Iowa Reptiles Evaluated by the IWAP.

Taxonomic order derived from: the Society for the Study of Amphibians and Reptiles Standard English and Scientific Names Document, which can be accessed at: <http://ssarherps.org/>

Iowa Status/Listing: **Iowa Status** refers to Species of Greatest Conservation Need (SGCN) status as determined through IWAP species conservation status assessments. **Iowa Listing** refers to Iowa Endangered, Threatened, or Special Concern Status (from Iowa Code Chapter 77) as of 2015. For up-to-date state listing information, please see the Threatened and Endangered Species Program page on the DNR website at www.iowadnr.gov

National Rank/Listing: **National Rank** refers to NatureServe Conservation Status Ranks. N1 = Critically Imperiled in Nation; N2 = Imperiled in Nation; N3 = Vulnerable in Nation; N4 = Apparently Secure in Nation; N5 = Secure in Nation. For additional definitions and explanation see Appendix 14. **National Listing** refers to federally Endangered or Threatened species.

Assessments of species conservation status undertaken as part of the IWAP are used to determine SGCN status only. Other information is provided as a reference. Updates to State Wildlife Action Plans, NatureServe National Ranks, Federal T&E Status, and State T&E Status are each independent processes, undertaken by different entities with differing timeframes. As such, the various listings or status ranks for a given species at a given point in time may not always appear to be in accord.

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
Order: Chelonia				
Family: Chelydridae – Snapping Turtles				
1	Snapping Turtle	<i>Chelydra serpentina</i>	SGCN	N5
Family: Emydidae – Freshwater Turtles				
1	Painted Turtle	<i>Chrysemys picta</i>		N5
2	Blanding's Turtle	<i>Emydoidea blandingii</i>	SGCN Threatened	N4
3	Wood Turtle	<i>Glyptemys insculpta</i>	SGCN Endangered	N3
4	Northern Map Turtle	<i>Graptemys geographica</i>	SGCN	N5
5	Southern Map Turtle	<i>Graptemys ouachitensis</i>	SGCN	N5
6	False Map Turtle	<i>Graptemys pseudogeographica</i>	SGCN	N5
7	Ornate Box Turtle	<i>Terrapene ornata</i>	SGCN Threatened	N5
8	Pond (Red-eared) Slider	<i>Trachemys scripta elegans</i>		N5
Family: Kinosternidae – Mud and Musk Turtles				

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
1	Yellow Mud Turtle	<i>Kinosternon flavescens</i>	SGCN Endangered	N5
2	Eastern Musk Turtle	<i>Sternotherus odoratus</i>	SGCN Threatened	N5
Family: Trionychidae - Softshells				
1	Smooth Softshell Turtle	<i>Apalone mutica</i>	SGCN	N5
2	Spiny Softshell Turtle	<i>Apalone spinifera</i>	SGCN	N5
Order: Squamata – Suborder: Lacertilia				
Family: Anguidae – Glass Lizards				
1	Slender Glass Lizard	<i>Ophisaurus attenuatus</i>	SGCN Threatened	N5
Family: Scincidae - Skinks				
1	Five-Lined Skink	<i>Plestiodon faciatus</i>	SGCN	N5
2	Great Plains Skink	<i>Plestiodon obsoletus</i>	SGCN Endangered	N5
3	Prairie Skink	<i>Plestiodon septentrionalis</i>	SGCN	N5
Family: Teiidae – Racerunners and Whiptails				
1	Six-Lined Racerunner	<i>Aspidoscelis sexlineata</i>	SGCN	N5
Order: Squamata – Suborder: Serpentes				
Family: Colubridae – Harmless Snakes				
1	Western Worm Snake	<i>Carphophis vermis</i>	SGCN Threatened	N5
2	North American Racer	<i>Coluber constrictor</i>		N5
3	Ringneck Snake	<i>Diadophis punctatus</i>	SGCN	N5
4	Western (Plains) Hognose Snake	<i>Heterodon nasicus</i>	SGCN Endangered	N5
5	Eastern Hognose Snake	<i>Heterodon platirhinos</i>	SGCN	N5
6	Prairie Kingsnake	<i>Lampropeltis calligaster</i>	SGCN	N5
7	Speckled Kingsnake	<i>Lampropeltis holbrooki</i>	SGCN Threatened	N5
8	Eastern Milk Snake	<i>Lampropeltis triangulum</i>		N5
9	Plainbelly (Copperbelly) Watersnake	<i>Nerodia erythrogaster</i>	SGCN Endangered	N5 Threatened*
10	Diamondback Water Snake	<i>Nerodia rhombifer</i>	SGCN Threatened	N5
11	Common Water Snake	<i>Nerodia sipedon</i>	SGCN	N5
12	Smooth Green Snake	<i>Opheodrys vernalis</i>	SGCN Special Concern	N5
13	Western (Black) Rat Snake	<i>Pantherophis obsoletus</i>	SGCN	N5
14	Western Fox Snake	<i>Pantherophis ramspotti</i>	SGCN	N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
15	Gopher (Bull) Snake	<i>Pituophis catenifer</i>	SGCN Special Concern	N5
16	Graham's Crayfish Snake	<i>Regina grahamii</i>	SGCN	N5
17	Brown Snake	<i>Storeria dekayi</i>		N5
18	Redbelly Snake	<i>Storeria occipitomaculata</i>	SGCN	N5
19	Western Ribbon Snake	<i>Thamnophis proximus</i>	SGCN	N5
20	Plains Garter Snake	<i>Thamnophis radix</i>	SGCN	N5
21	Common Garter Snake	<i>Thamnophis sirtalis</i>		N5
22	Lined Snake	<i>Tropidoclonion lineatum</i>	SGCN	N5
23	Smooth Earth Snake	<i>Virginia valeriae</i>	SGCN	N5
Family: Viperidae - Vipers				
1	Copperhead	<i>Agkistrodon contortrix</i>	SGCN Endangered	N5
2	Timber Rattlesnake	<i>Crotalus horridus</i>	SGCN	N4
3	Prairie Rattlesnake	<i>Crotalus viridis</i>	SGCN Endangered	N5
4	Eastern Massasauga	<i>Sistrurus catenatus</i>	SGCN Endangered	N3 Candidate
5	Western Massasauga	<i>Sistrurus turgeminus</i>	SGCN	N3N4 Candidate

*The Copperbelly Water Snake (*Nerodia erythrogaster neglecta*) was renamed Plainbelly Water Snake (*Nerodia erythrogaster*) after the subspecies designation was removed. However, the Copperbelly Water Snake (*Nerodia erythrogaster neglecta*) is still federally listed as threatened (status not yet updated to show recent taxonomic name change).

Data Deficient Species – Species evaluated by Reptile and Amphibian subcommittee for which insufficient information was available to conduct a conservation status assessment

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
1	Speckled Kingsnake	<i>Lampropeltis holbrooki</i>	SGCN Threatened	N5

Removed from List of Iowa Species

Common Name	Scientific Name	Explanation
Alligator Snapping Turtle	<i>Macrochelys temminckii</i>	Sole record not considered credible
Yellowbelly Watersnake	<i>Nerodia erythrogaster flavigaster</i>	Records mistakenly identified as this subspecies
Rough Greensnake	<i>Opheodrys aestivus</i>	Records mistakenly attributed to Iowa

Appendix 5. List of Iowa Breeding Birds Evaluated by the IWAP.

Taxonomic order and nomenclature derived from: the American Ornithologists' Union Check-List of North American Birds, which can be accessed at: <http://www.aou.org/checklist/north/>

Iowa Status/Listing: **Iowa Status** refers to Species of Greatest Conservation Need (SGCN) status as determined through IWAP species conservation status assessments. **Iowa Listing** refers to Iowa Endangered, Threatened, or Special Concern Status (from Iowa Code Chapter 77) as of 2015. For up-to-date state listing information, please see the Threatened and Endangered Species Program page on the DNR website at www.iowadnr.gov.

National Rank/Listing: **National Rank** refers to NatureServe Conservation Status Ranks. N1 = Critically Imperiled in Nation; N2 = Imperiled in Nation; N3 = Vulnerable in Nation; N4 = Apparently Secure in Nation; N5 = Secure in Nation. For additional definitions and explanation see Appendix 14. **National Listing** refers to federally Endangered or Threatened species.

Regionally Important: Partners In Flight regionally important birds in Bird Conservation Regions 11 (Prairie Pothole), 22 (Eastern Tallgrass Prairie), and 23 (Prairie Hardwood Transition).

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	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
1	Canada Goose	<i>Branta canadensis</i>		N5B, N5N	
2	Mute Swan	<i>Cygnus olor</i>		NNA	
3	Trumpeter Swan	<i>Cygnus buccinator</i>	SGCN	N4B, N4N	
4	American Wigeon	<i>Anas americana</i>	SGCN	N5B, N5N	
5	Wood Duck	<i>Aix sponsa</i>		N5B, N5N	
6	Gadwall	<i>Anas strepera</i>		N5B, N5N	
7	American Black Duck	<i>Anas rubripes</i>		N5B, N5N	
8	Mallard	<i>Anas platyrhynchos</i>		N5B, N5N	
9	Blue-winged Teal	<i>Anas discors</i>	SGCN	N5B, N5N	
10	Northern Shoveler	<i>Anas clypeata</i>		N5B, N5N	
11	Northern Pintail	<i>Anas acuta</i>	SGCN	N5B, N5N	
12	Green-winged Teal	<i>Anas crecca</i>		N5B, N5N	
13	Canvasback	<i>Aythya valisineria</i>	SGCN	N5B, N5N	
14	Redhead	<i>Aythya americana</i>	SGCN	N5B, N5N	
15	Ring-necked Duck	<i>Aythya collaris</i>	SGCN	N5B, N5N	

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
16	Lesser Scaup	<i>Aythya affinis</i>	SGCN	N5B, N5N	
17	Hooded Merganser	<i>Lophodytes cucullatus</i>		N5B, N5N	
18	Ruddy Duck	<i>Oxyura jamaicensis</i>		N5B, N5N	
19	Northern Bobwhite	<i>Colinus virginianus</i>	SGCN	N5	22, 23
20	Gray Partridge	<i>Perdix perdix</i>		NNA	
21	Ring-necked Pheasant	<i>Phasianus colchicus</i>		NNA	
22	Ruffed Grouse	<i>Bonasa umbellus</i>	SGCN	N5	11, 23
23	Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	SGCN	N4	11
24	Greater Prairie-Chicken	<i>Tympanuchus cupido</i>	SGCN	N4	11, 22, 23
25	Wild Turkey	<i>Meleagris gallopavo</i>		N5	
26	Pied-billed Grebe	<i>Podilymbus podiceps</i>		N5B, N5N	
27	Red-necked Grebe	<i>Podiceps grisegena</i>	SGCN	N5B, N5N	
28	Eared Grebe	<i>Podiceps nigricollis</i>	SGCN	N5B, N5N	
29	Western Grebe	<i>Aechmophorus occidentalis</i>		N5B, N5N	
30	American White Pelican	<i>Pelecanus erythrorhynchos</i>	SGCN	N4	
31	Neotropic Cormorant	<i>Phalacrocorax brasilianus</i>		N4	
32	Double-crested Cormorant	<i>Phalacrocorax auritus</i>		N5B, N5N	
33	American Bittern	<i>Botaurus lentiginosus</i>	SGCN	N4B, N4N	
34	Least Bittern	<i>Ixobrychus exilis</i>		N5B, N5N	
35	Great Blue Heron	<i>Ardea herodias</i>		N5B, N5N	
36	Great Egret	<i>Ardea albus</i>		N5B, N5N	
37	Cattle Egret	<i>Bubulcus ibis</i>		N5B, N5N	
38	Green Heron	<i>Butorides virescens</i>		N5B, N5N	
39	Black-crowned Night- Heron	<i>Nycticorax nycticorax</i>	SGCN	N5B, N5N	
40	Yellow-crowned Night- Heron	<i>Nyctanassa violacea</i>		N5B, N5N	
41	White-faced Ibis	<i>Plegadis chihi</i>	SGCN	N4B, N4N	
42	Turkey Vulture	<i>Cathartes aura</i>		N5B, N5N	
43	Osprey	<i>Pandion haliaetus</i>		N5B, N4N	
44	Mississippi Kite	<i>Ictinia mississippiensis</i>		N5B	
45	Bald Eagle	<i>Haliaeetus leucocephalus</i>	SGCN Special Concern	N5B, N5N	
46	Northern Harrier	<i>Circus cyaneus</i>	SGCN Endangered	N5B, N5N	11
47	Sharp-shinned Hawk	<i>Accipiter striatus</i>		N5B, N5N	
48	Cooper's Hawk	<i>Accipiter cooperii</i>		N5B, N5N	23

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
49	Red-shouldered Hawk	<i>Buteo lineatus</i>	SGCN Endangered	N5B, N5N	
50	Broad-winged Hawk	<i>Buteo platypterus</i>	SGCN	N5B	
51	Swainson's Hawk	<i>Buteo swainsoni</i>	SGCN	N5B	11
52	Red-tailed Hawk	<i>Buteo jamaicensis</i>		N5B, N5N	
53	King Rail	<i>Rallus elegans</i>	SGCN Endangered	N4B, N4N	
54	Virginia Rail	<i>Rallus limicola</i>		N5B, N5N	
55	Sora	<i>Porzana carolina</i>		N5B, N5N	
56	Common Gallinule (formerly Moorhen)	<i>Gallinula galeata</i>	SGCN	N5B, N5N	
57	American Coot	<i>Fulica americana</i>		N5B, N5N	
58	Sandhill Crane	<i>Grus canadensis</i>		N5B, N5N	
59	Whooping Crane	<i>Grus americana</i>		N1N	
60	Piping Plover	<i>Charadrius melodus</i>	SGCN Endangered	N3B, N3N Endangered	
61	Killdeer	<i>Charadrius vociferus</i>		N5B, N5N	
62	Black-necked Stilt	<i>Himantopus mexicanus</i>		N5B, N5N	
63	Spotted Sandpiper	<i>Actitis macularia</i>		N5B, N5N	
64	Upland Sandpiper	<i>Bartramia longicauda</i>	SGCN	N5B	
65	Wilson's Snipe	<i>Gallinago delicata</i>	SGCN	N5B, N5N	
66	American Woodcock	<i>Scolopax minor</i>	SGCN	N5B, N5N	
67	Wilson's Phalarope	<i>Phalaropus tricolor</i>	SGCN	N5B	
68	Franklin's Gull	<i>Larus pipixcan</i>	SGCN	N4B	
69	Ring-billed Gull	<i>Larus delawarensis</i>		N5B, N5N	
70	Least Tern	<i>Sterna antillarum</i>	SGCN Endangered	N4B Endangered	
71	Black Tern	<i>Chlidonias niger</i>	SGCN Special Concern	N4B	
72	Forster's Tern	<i>Sterna forsteri</i>	SGCN Special Concern	N5B, N5N	
73	White-winged Dove	<i>Zenaida asiatica</i>		N5	
74	Rock Pigeon	<i>Columba livia</i>		NNA	
75	Eurasian Collared-Dove	<i>Streptopelia decaocto</i>		NNA	
76	Mourning Dove	<i>Zenaida macroura</i>		N5	
77	Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	SGCN	N5B	22, 23
78	Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	SGCN	N5B	11, 22, 23,

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
79	Barn Owl	<i>Tyto alba</i>	SGCN Endangered	N5	
80	Eastern Screech-Owl	<i>Otus asio</i>	SGCN	N5	
81	Great Horned Owl	<i>Bubo virginianus</i>		N5	
82	Burrowing Owl	<i>Athene cunicularia</i>	SGCN	N4B, N4N	11
83	Barred Owl	<i>Strix varia</i>		N5	
84	Long-eared Owl	<i>Asio otus</i>	Threatened	N5B, N5N	11
85	Short-eared Owl	<i>Asio flammeus</i>	SGCN Endangered	N5B, N5N	11
86	Common Nighthawk	<i>Chordeiles minor</i>	SGCN	N5B	11, 22
87	Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	SGCN	N5B	
88	Eastern Whip-poor-will	<i>Caprimulgus vociferus</i>	SGCN	N5B	22, 23
89	Chimney Swift	<i>Chaetura pelagica</i>	SGCN	N5B	11, 22, 23
90	Ruby-throated Hummingbird	<i>Archilochus colubris</i>		N5B	
91	Belted Kingfisher	<i>Ceryle alcyon</i>	SGCN	N5B, N5N	11, 22, 23
92	Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	SGCN	N5B, N5N	11, 22, 23
93	Red-bellied Woodpecker	<i>Melanerpes carolinus</i>		N5B, N5N	
94	Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>		N5B, N5N	
95	Downy Woodpecker	<i>Picoides pubescens</i>		N5	
96	Hairy Woodpecker	<i>Picoides villosus</i>		N5	
97	Northern Flicker	<i>Colaptes auratus</i>	SGCN	N5B, N5N	11, 22, 23
98	Pileated Woodpecker	<i>Dryocopus pileatus</i>		N5	
99	American Kestrel	<i>Falco sparverius</i>	SGCN	N5B, N5N	23
100	Peregrine Falcon	<i>Falco peregrinus</i>	SGCN Special Concern	N4B, N4N	
101	Eastern Wood-Pewee	<i>Contopus virens</i>	SGCN	N5B	22
102	Acadian Flycatcher	<i>Empidonax vireescens</i>	SGCN	N5B	22, 23
103	Alder Flycatcher	<i>Empidonax alnorum</i>		N5B	
104	Willow Flycatcher	<i>Empidonax traillii</i>		N5B	23
105	Least Flycatcher	<i>Empidonax minimus</i>		N5B	
106	Eastern Phoebe	<i>Sayornis phoebe</i>		N5B, N5N	
107	Say's Phoebe	<i>Sayornis saya</i>	SGCN	N4B, N5N	
108	Great Crested Flycatcher	<i>Myiarchus crinitus</i>		N5B	
109	Western Kingbird	<i>Tyrannus verticalis</i>		N5B	
110	Eastern Kingbird	<i>Tyrannus tyrannus</i>	SGCN	N5B	11, 22, 23
111	Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>		N5B	

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
112	Loggerhead Shrike	<i>Lanius ludovicianus</i>	SGCN	N4	11, 22
113	White-eyed Vireo	<i>Vireo griseus</i>		N5B, N5N	
114	Bell's Vireo	<i>Vireo bellii</i>	SGCN	N4B	22
115	Yellow-throated Vireo	<i>Vireo flavifrons</i>		N5B, N4N	23
116	Warbling Vireo	<i>Vireo gilvus</i>		N5B	
117	Red-eyed Vireo	<i>Vireo olivaceus</i>		N5B	
118	Blue Jay	<i>Cyanocitta cristata</i>		N5B, N5N	
119	Black-billed Magpie	<i>Pica pica</i>		N5	11
120	American Crow	<i>Corvus brachyrhynchos</i>		N5B, N5N	
121	Horned Lark	<i>Eremophila alpestris</i>	SGCN	N5B, N5N	11, 22, 23
122	Purple Martin	<i>Progne subis</i>	SGCN	N5B	22
123	Tree Swallow	<i>Tachycineta bicolor</i>		N5B, N5N	23
124	N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>		N5B, N5N	
125	Bank Swallow	<i>Riparia riparia</i>	SGCN	N5B	11, 22, 23
126	Cliff Swallow	<i>Hirundo pyrrhonota</i>		N5B	
127	Barn Swallow	<i>Hirundo rustica</i>		N5B	
128	Black-capped Chickadee	<i>Parus atricapillus</i>		N5	
129	Tufted Titmouse	<i>Parus bicolor</i>		N5	
130	Red-breasted Nuthatch	<i>Sitta canadensis</i>		N5	
131	White-breasted Nuthatch	<i>Sitta carolinensis</i>		N5	23
132	Brown Creeper	<i>Certhia americana</i>		N5	
133	Rock Wren	<i>Salpinctes obsoletus</i>		N5	
134	House Wren	<i>Troglodytes aedon</i>		N5B, N5N	
135	Winter Wren	<i>Troglodytes troglodytes</i>		N5	
136	Sedge Wren	<i>Cistothorus platensis</i>	SGCN	N4B, N5N	11
137	Marsh wren	<i>Cistothorus palustris</i>		N5B, N5N	11, 23
138	Carolina Wren	<i>Thryothorus ludovicianus</i>		N5	
139	Bewick's Wren	<i>Thryomanes bewickii</i>	SGCN	N5B	
140	Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>		N5B, N5N	
141	Eastern Bluebird	<i>Sialia sialis</i>		N5B, N5N	
142	Veery	<i>Catharus fuscescens</i>	SGCN	N5B	23
143	Wood Thrush	<i>Hylocichla mustelina</i>	SGCN	N5B	22, 23
144	American Robin	<i>Turdus migratorius</i>		N5	
145	Gray Catbird	<i>Dumetella carolinensis</i>		N5B, N5N	23
146	Northern Mockingbird	<i>Mimus polyglottos</i>		N5	
147	Brown Thrasher	<i>Toxostoma rufum</i>	SGCN	N5	11, 22, 23
148	European Starling	<i>Sturnus vulgaris</i>		NNR	

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
149	Cedar Waxwing	<i>Bombycilla cedrorum</i>		N5	23
150	Ovenbird	<i>Seiurus aurocapillus</i>		N5B	
151	Worm-eating Warbler	<i>Helmitheros vermivorus</i>	SGCN	N5B	
152	Louisiana Waterthrush	<i>Seiurus motacilla</i>		N5B	
153	Golden-winged Warbler	<i>Vermivora chrysoptera</i>	SGCN	N4B	11, 23
154	Blue-winged Warbler	<i>Vermivora pinus</i>		N5B	23
155	Black-and-white Warbler	<i>Mniotilta varia</i>		N5B, N4NN5N	
156	Prothonotary Warbler	<i>Protonotaria citrea</i>	SGCN	N5B	22
157	Kentucky Warbler	<i>Oporornis formosus</i>	SGCN	N5B	22
158	Common Yellowthroat	<i>Geothlypis trichas</i>	SGCN	N5	22, 23
159	Hooded Warbler	<i>Wilsonia citrina</i>		N5B	
160	American Redstart	<i>Setophaga ruticilla</i>		N5B	
161	Cerulean Warbler	<i>Setophaga cerulea</i>	SGCN	N4B	22, 23
162	Northern Parula	<i>Parula americana</i>		N5B	
163	Yellow Warbler	<i>Dendroica petechia</i>		N5B, N5N	
164	Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>		N5B	
165	Pine Warbler	<i>Dendroica pinus</i>		N5B, N5N	
166	Yellow-throated Warbler	<i>Dendroica dominica</i>		N5B	
167	Prairie Warbler	<i>Dendroica discolor</i>		N5B	
168	Yellow-breasted Chat	<i>Icteria virens</i>		N5B	22
169	Eastern Towhee	<i>Pipilo erythrophthalmus</i>		N5B	23
170	Chipping Sparrow	<i>Spizella passerina</i>		N5B, N5N	
171	Clay-colored Sparrow	<i>Spizella pallid</i>		N5B, N4N	11
172	Field Sparrow	<i>Spizella pusilla</i>	SGCN	N5	11, 22, 23
173	Vesper Sparrow	<i>Pooecetes gramineus</i>		N5B, N5N	11, 23
174	Lark Sparrow	<i>Chondestes grammacus</i>		N5B	
175	Savannah Sparrow	<i>Passerculus sandwichensis</i>		N5B, N5N	11
176	Grasshopper Sparrow	<i>Ammodramus savannarum</i>	SGCN	N5B, N5N	11, 22, 23
177	Henslow's Sparrow	<i>Ammodramus henslowii</i>	SGCN Threatened	N3B, N4N	22, 23
178	Song Sparrow	<i>Melospiza melodia</i>		N5	23
179	Swamp Sparrow	<i>Melospiza georgiana</i>		N5B, N5N	
180	Summer Tanager	<i>Piranga rubra</i>		N5B	
181	Scarlet Tanager	<i>Piranga olivacea</i>		N5B	
182	Northern Cardinal	<i>Cardinalis cardinalis</i>		N5	
183	Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>		N5B	
184	Blue Grosbeak	<i>Guiraca caerulea</i>		N5B	
185	Indigo Bunting	<i>Passerina cyanea</i>		N5B	

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
186	Dickcissel	<i>Spiza americana</i>	SGCN	N5B	11, 22, 23
187	Bobolink	<i>Dolichonyx oryzivorus</i>	SGCN	N5B	11, 22, 23
188	Red-winged Blackbird	<i>Agelaius phoeniceus</i>		N5	22, 23
189	Eastern Meadowlark	<i>Sturnella magna</i>	SGCN	N5	22, 23
190	Western Meadowlark	<i>Sturnella neglecta</i>	SGCN	N5	11
191	Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>		N5B, N5N	11, 23
192	Common Grackle	<i>Quiscalus quiscula</i>		N5	
193	Great-tailed Grackle	<i>Quiscalus mexicanus</i>		N5	
194	Brown-headed Cowbird	<i>Molothrus ater</i>		N5	
195	Orchard Oriole	<i>Icterus spurius</i>		N5B	
196	Baltimore Oriole	<i>Icterus galbula</i>	SGCN	N5B	22, 23
197	American Goldfinch	<i>Spinus tristis</i>		N5	
198	House Finch	<i>Carpodacus mexicanus</i>		N5	
199	Red Crossbill	<i>Loxia curvirostra</i>		N5	
200	Pine Siskin	<i>Spinus pinus</i>		N5	11
201	House Sparrow	<i>Passer domesticus</i>		NNR	
202	Eurasian Tree Sparrow	<i>Passer montanus</i>		NNA	

Appendix 6. List of Non-breeding Birds Evaluated by the IWAP.

Taxonomic order and nomenclature derived from: the American Ornithologists' Union Check-List of North American Birds, which can be accessed at: <http://www.aou.org/checklist/north/>

Iowa Status/Listing: **Iowa Status** refers to Species of Greatest Conservation Need (SGCN) status as determined through IWAP species conservation status assessments. **Iowa Listing** refers to Iowa Endangered, Threatened, or Special Concern Status (from Iowa Code Chapter 77) as of 2015. For up-to-date state listing information, please see the Threatened and Endangered Species Program page on the DNR website at www.iowadnr.gov.

National Rank/Listing: **National Rank** refers to NatureServe Conservation Status Ranks. N1 = Critically Imperiled in Nation; N2 = Imperiled in Nation; N3 = Vulnerable in Nation; N4 = Apparently Secure in Nation; N5 = Secure in Nation. For additional definitions and explanation see Appendix 14. **National Listing** refers to federally Endangered or Threatened species.

Regionally Important: Partners in Flight regionally important birds in Bird Conservation Regions 11 (Prairie Pothole), 22 (Eastern Tallgrass Prairie), and 23 (Prairie Hardwood Transition).

Assessments of species conservation status undertaken as part of the IWAP are used to determine SGCN status only. Other information is provided as a reference. Updates to State Wildlife Action Plans, NatureServe National Ranks, Federal T&E Status, and State T&E Status are each independent processes, undertaken by different entities with differing timeframes. As such, the various listings or status ranks for a given species at a given point in time may not always appear to be in accord.

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
1	Greater White-fronted Goose	<i>Anser albifrons</i>		N5B, N5N	
2	Snow Goose	<i>Anser caerulescens</i>		N5B, N5N	
3	Ross's Goose	<i>Anser rossii</i>		N4N	
4	Cackling Goose	<i>Branta hutchinsii</i>		NNR	
5	Tundra Swan	<i>Cygnus columbianus</i>		N5B, N5N	
6	Greater Scaup	<i>Aythya marila</i>	SGCN	N5B, N5N	
7	Common Goldeneye	<i>Bucephala clangula</i>		N5B, N5N	
8	Bufflehead	<i>Bucephala albeola</i>		N5B, N5N	
9	Common merganser	<i>Mergus merganser</i>		N5B, N5N	
10	Red-breasted Merganser	<i>Mergus serrator</i>		N5B, N5N	
11	Common Loon	<i>Gavia immer</i>	SGCN	N4B, N5N	
12	Horned Grebe	<i>Podiceps auritus</i>		N5B, N5N	
13	Snowy Egret	<i>Egretta thula</i>		N5B, N5N	
14	Little Blue Heron	<i>Egretta caerulea</i>	SGCN	N5B, N5N	

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
15	Glossy Ibis	<i>Plegadis falcinellus</i>		N4B, N4N	
16	Northern Goshawk	<i>Accipiter gentilis</i>		N4B, N4N	
17	Rough-legged Hawk	<i>Buteo lagopus</i>		N5B, N5N	
18	Golden Eagle	<i>Aquila chrysaetos</i>		N5B, N5N	11
19	Yellow Rail	<i>Coturnicops noveboracensis</i>	SGCN	N3B, N4N	
20	Black Rail	<i>Laterallus jamaicensis</i>	SGCN	N3B, N3N	
21	Whooping Crane	<i>Grus americana</i>	SGCN	N1N Endangered	
22	Black-bellied Plover	<i>Pluvialis squatarola</i>	SGCN	N5B, N5N	
23	American Golden-Plover	<i>Pluvialis dominica</i>	SGCN	N5B	
24	Semipalmated Plover	<i>Charadrius semipalmatus</i>		N5B, N5N	
25	American Avocet	<i>Recurvirostra americana</i>		N5B, N5N	
26	Solitary Sandpiper	<i>Tringa solitaria</i>		N4B, N5N	
27	Greater Yellowlegs	<i>Tringa melanoleuca</i>		N5B, N5N	
28	Willet	<i>Catoptrophorus semipalmatus</i>		N5B, N5N	
29	Lesser Yellowlegs	<i>Tringa flavipes</i>	SGCN	N5B, N5N	
30	Whimbrel	<i>Numenius phaeopus</i>	SGCN	N5B, N5N	
31	Long-billed Curlew	<i>Numenius americanus</i>	SGCN	N5B, N5N	
32	Hudsonian Godwit	<i>Limosa haemastica</i>	SGCN	N3?B	
33	Marbled Godwit	<i>Limosa fedoa</i>	SGCN	N5B, N5N	
34	Ruddy Turnstone	<i>Arenaria interpres</i>	SGCN	N5B, N5N	
35	Red Knot	<i>Calidris canutus</i>	SGCN	N5B Threatened	
36	Sanderling	<i>Calidris alba</i>	SGCN	N4B, N5N	
37	Semipalmated Sandpiper	<i>Calidris pusilla</i>	SGCN	N5B	
38	Western Sandpiper	<i>Calidris mauri</i>		N5B, N5N	
39	Least Sandpiper	<i>Calidris minutilla</i>		N5B, N5N	
40	White-rumped Sandpiper	<i>Calidris fuscicollis</i>	SGCN	N3B	
41	Baird's Sandpiper	<i>Calidris bairdii</i>		N4B	
42	Pectoral Sandpiper	<i>Calidris melanotos</i>	SGCN	N5B	
43	Sharp-tailed Sandpiper	<i>Calidris acuminata</i>		NNR	
44	Dunlin	<i>Calidris alpina</i>		N5B, N5N	
45	Stilt Sandpiper	<i>Caladris himantopus</i>	SGCN	N3B, N4N	
46	Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	SGCN	N4B	
47	Short-billed Dowitcher	<i>Limnodromus griseus</i>	SGCN	N5B, N5N	
48	Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	SGCN	N5B, N5N	

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
49	Red-necked Phalarope	<i>Phalaropus lobatus</i>		N4NN5B	
50	Bonaparte's Gull	<i>Larus philadelphia</i>		N5B, N5N	
51	Herring Gull	<i>Larus argentatus</i>		N5B, N5N	
52	Glaucous Gull	<i>Larus hyperboreus</i>		N5B, N5N	
53	Caspian Tern	<i>Sterna caspia</i>	SGCN	N4N5B, N4N	
54	Common Tern	<i>Sterna hirundo</i>		N5B	
55	Northern Saw-whet Owl	<i>Aegolius acadicus</i>		N5B, N5N	
56	Snowy Owl	<i>Nyctea scandiaca</i>		N4B, N4N	
57	Merlin	<i>Falco columbarius</i>		N4B, N4N	
58	Prairie Falcon	<i>Falco mexicanus</i>		N5B, N5N	11
59	Olive-sided Flycatcher	<i>Contopus cooperi</i>	SGCN	N4B	
60	Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>		N5B	
61	Northern Shrike	<i>Lanius excubitor</i>		N4B, N5N	
62	Blue-headed Vireo	<i>Vireo solitarius</i>		N5B, N5N	
63	Philadelphia Vireo	<i>Vireo philadelphicus</i>		N4B	
64	Golden-crowned Kinglet	<i>Regulus satrapa</i>		N5	
65	Ruby-crowned Kinglet	<i>Regulus calendula</i>		N5B, N5N	
66	Townsend's Solitaire	<i>Myadestes townsendi</i>		N5	
67	Gray-cheeked Thrush	<i>Catharus minimus</i>		N5B	
68	Swainson's Thrush	<i>Catharus ustulatus</i>		N5B	
69	Hermit Thrush	<i>Catharus guttatus</i>		N5	
70	Varied Thrush	<i>Zoothera naevia</i>		N5	
71	American Pipit	<i>Anthus rubescens</i>		N5B, N5N	
72	Sprague's Pipit	<i>Anthus spragueii</i>	SGCN	N4B, N4N Candidate	11
73	Bohemian Waxwing	<i>Bombycilla garrulus</i>	SGCN	N5B, N5N	
74	Lapland Longspur	<i>Calcarius lapponicus</i>		N5B, N5N	
75	Smith's Longspur	<i>Calcarius pictus</i>	SGCN	N4B, N5N	
76	Snow Bunting	<i>Plectrophenax nivalis</i>		N5B, N5N	
77	Northern Waterthrush	<i>Seiurus noveboracensis</i>		N5B	
78	Tennessee Warbler	<i>Vermivora peregrina</i>		N5B	
79	Orange-crowned Warbler	<i>Vermivora celata</i>		N5B, N5N	
80	Nashville Warbler	<i>Vermivora ruficapilla</i>		N5B	
81	Connecticut Warbler	<i>Oporornis agilis</i>		N3B	11
82	Mourning Warbler	<i>Oporornis philadelphia</i>		N5B	
83	Cape May Warbler	<i>Dendroica tigrina</i>		N5B	
84	Magnolia Warbler	<i>Dendroica magnolia</i>		N5B	
85	Bay-breasted Warbler	<i>Dendroica castanea</i>	SGCN	N5B	

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
86	Blackburnian Warbler	<i>Dendroica fusca</i>		N5B	
87	Blackpoll Warbler	<i>Dendroica striata</i>		N5B	
88	Black-throated Blue Warbler	<i>Dendroica caerulescens</i>		N5B	
89	Palm Warbler	<i>Dendroica palmarum</i>		N4B, N5N	
90	Yellow-rumped Warbler	<i>Dendroica coronata</i>		N5B, N5N	
91	Black-throated Green Warbler	<i>Dendroica virens</i>		N5B	
92	Canada Warbler	<i>Wilsonia canadensis</i>	SGCN	N5B	23
93	Wilson's Warbler	<i>Wilsonia pusilla</i>		N5B	
94	Spotted Towhee	<i>Pipilo maculatus</i>		N5	
95	American Tree Sparrow	<i>Spizella arborea</i>	SGCN	N5B, N5N	
96	Le Conte's Sparrow	<i>Ammodramus leconteii</i>	SGCN	N3B, N4N	11
97	Nelson's Sparrow	<i>Ammodramus nelsoni</i>		N3B, N5N	11
98	Fox Sparrow	<i>Passerella iliaca</i>		N5B, N5N	
99	Lincoln's Sparrow	<i>Melospiza lincolni</i>		N5B, N5N	
100	White-throated Sparrow	<i>Zonotrichia albicollis</i>		N5B, N5N	
101	Harris's Sparrow	<i>Zonotrichia querula</i>	SGCN	N5N	
102	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>		N5B, N5N	
103	Dark-eyed Junco	<i>Junco hyemalis</i>		N5	
104	Rusty Blackbird	<i>Euphagus carolinus</i>		N4B, N4N	
105	Brewer's Blackbird	<i>Euphagus cyanocephalus</i>		N5B, N5N	
106	Purple Finch	<i>Carpodacus purpureus</i>		N5B, N5N	
107	White-winged Crossbill	<i>Loxia leucoptera</i>	SGCN	N5	
108	Common Redpoll	<i>Acanthis flammea</i>		N5B, N5N	

Vagrant Species - These species are considered stray or vagrant in Iowa. They have confirmed documentation of occurrence in the state but do not have established populations within Iowa. In some years, populations of these species expand into portions of the state.

	Common Name	Scientific Name	National Rank/Listing
1	Taiga Bean-Goose	<i>Anser fabalis</i>	NNR
2	Black-bellied Whistling-Duck	<i>Dendrocygna autumnalis</i>	N5
3	Brant	<i>Branta bernicla</i>	N5B, N5N
4	Eurasian Wigeon	<i>Anas penelope</i>	N3N
5	Cinnamon Teal	<i>Anas cyanoptera</i>	N5B, N5N
6	Garganey	<i>Anas querquedula</i>	NNR
7	King Eider	<i>Somateria spectabilis</i>	N4B, N4N

	Common Name	Scientific Name	National Rank/Listing
8	Common Eider	<i>Somateria mollissima</i>	N5B, N5N
9	Harlequin Duck	<i>Histrionicus histrionicus</i>	N4B, N4N
10	Surf Scoter	<i>Melanitta perspicillata</i>	N5B, N5N
11	White-winged Scoter	<i>Melanitta fusca</i>	N5B, N5N
12	Black Scoter	<i>Melanitta nigra</i>	N5B, N5N
13	Long-tailed Duck	<i>Clangula hyemalis</i>	N5B, N5N
14	Barrow's Goldeneye	<i>Bucephala islandica</i>	N5B, N5N
15	Red-throated Loon	<i>Gavia stellata</i>	N5B, N5N
16	Pacific Loon	<i>Gavia pacifica</i>	N5B, N4N5N
17	Yellow-billed Loon	<i>Gavia adamsii</i>	N3B
18	Clark's Grebe	<i>Aechmophorus clarkii</i>	N5B, N5N
19	Magnificent Frigatebird	<i>Fregata magnificens</i>	NNRB, N4N
20	Anhinga	<i>Anhinga anhinga</i>	N5B, N5N
21	Brown Pelican	<i>Pelecanus occidentalis</i>	N4B, N4N
22	Tricolored Heron	<i>Egretta tricolor</i>	N5B, N5N
23	Reddish Egret	<i>Egretta rufescens</i>	N4B, N4N
24	White Ibis	<i>Eudocimus albus</i>	N5B, N5N
25	Roseate Spoonbill	<i>Platalea ajaja</i>	N4
26	Wood Stork	<i>Mycteria americana</i>	N3
27	Swallow-tailed Kite	<i>Elanoides forficatus</i>	N3B
28	Black Vulture	<i>Coragyps atratus</i>	N5B, N5N
29	Ferruginous Hawk	<i>Buteo regalis</i>	N4B, N4N
30	Purple Gallinule	<i>Porphyrio martinica</i>	N4N, N5B
31	Snowy Plover	<i>Charadrius alexandrinus</i>	N3B, N3N
32	Eskimo Curlew	<i>Numenius borealis</i>	NHB
33	Ruff	<i>Philomachus pugnax</i>	N1B
34	Curlew Sandpiper	<i>Calidris ferruginea</i>	N3B
35	Red Phalarope	<i>Phalaropus fulicaria</i>	N5B
36	Pomarine Jaeger	<i>Stercorarius pomarinus</i>	N5B
37	Parasitic Jaeger	<i>Stercorarius parasiticus</i>	N5B
38	Long-tailed Jaeger	<i>Stercorarius longicaudus</i>	N5B
39	Thick-billed Murre	<i>Uria lomvia</i>	N5B, N5N
40	Long-billed Murrelet	<i>Brachyramphus perdix</i>	NNR
41	Ancient Murrelet	<i>Synthliboramphus antiquus</i>	N4B, N4N
42	Sabine's Gull	<i>Xema sabini</i>	N5B
43	Black-headed Gull	<i>Larus ridibundus</i>	N3N
44	Little Gull	<i>Larus minutus</i>	N1N2B, N2N3N

	Common Name	Scientific Name	National Rank/Listing
45	Ross's Gull	<i>Rhodostethia rosea</i>	NNR
46	Laughing Gull	<i>Larus atricilla</i>	N5B, N5N
47	Mew Gull	<i>Larus canus</i>	N5B, N5N
48	California Gull	<i>Larus californicus</i>	N5B, N5N
49	Thayer's Gull	<i>Larus thayeri</i>	N5N
50	Iceland Gull	<i>Larus glaucoides</i>	N3N4N
51	Lesser Black-backed Gull	<i>Larus fuscus</i>	N2N3N
52	Slaty-backed Gull	<i>Larus schistisagus</i>	NNR
53	Great Black-backed Gull	<i>Larus marinus</i>	N5B, N5N
54	Arctic Tern	<i>Sterna pardisaea</i>	N5B
55	Common Ground-Dove	<i>Columbina passerina</i>	N5
56	Groove-billed Ani	<i>Crotophaga sulcirostris</i>	N4
57	Northern Hawk Owl	<i>Surnia ulula</i>	N5
58	Great Gray Owl	<i>Strix nebulosa</i>	N4
59	Rufous Hummingbird	<i>Selasphorus rufus</i>	N5B
60	Lewis's Woodpecker	<i>Melanerpes lewis</i>	N4B, N4N
61	Black-backed Woodpecker	<i>Picoides arcticus</i>	N4
62	Gyrfalcon	<i>Falco rusticolus</i>	N3B, N3N4N
63	Western Wood-Pewee	<i>Contopus sordidulus</i>	N5B
64	Cordilleran Flycatcher (formerly Western)	<i>Empidonax occidentalis</i> (formerly <i>difficilis</i>)	N5B
65	Vermilion Flycatcher	<i>Pyrocephalus rubinus</i>	N5B, N5N
66	Gray Jay	<i>Perisoreus canadensis</i>	N5
67	Pinyon Jay	<i>Gymnorhinus</i> <i>cycanocephalus</i>	N5
68	Fish Crow	<i>Corvus ossifragus</i>	N5
69	Common Raven	<i>Corvus corax</i>	N5
70	Clark's Nutcracker	<i>Nucifraga columbiana</i>	N5
71	Boreal Chickadee	<i>Poecile hudsonica</i>	N5
72	Pygmy Nuthatch	<i>Sitta pygmaea</i>	N5
73	Boreal Chickadee	<i>Poecile hudsonica</i>	N5
74	Pygmy Nuthatch	<i>Sitta pygmaea</i>	N5
75	Mountain Bluebird	<i>Sialia currucoides</i>	N5
76	Sage Thrasher	<i>Oreoscoptes montanus</i>	N5B, N5N
77	Curve-billed Thrasher	<i>Toxostoma curvirostre</i>	N5
78	Chestnut-collared Longspur	<i>Calcarius ornatus</i>	N5B, N5N
79	MacGillivray's Warbler	<i>Oporornis tolmiei</i>	N5B

	Common Name	Scientific Name	National Rank/Listing
80	Black-throated Gray Warbler	<i>Dendroica nigrescens</i>	N5B
81	Townsend's Warbler	<i>Dendroica townsendi</i>	N5B, NNRN
82	Green-tailed Towhee	<i>Pipilo chlorurus</i>	N5B, N5N
83	Lark Bunting	<i>Calamospiza melanocorys</i>	N5B, N5N
84	Black-throated Sparrow	<i>Amphispiza bilineata</i>	N5
85	Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	N5B, N5N
86	Western Tanager	<i>Piranga ludoviciana</i>	N5B
87	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	N5B
88	Lazuli Bunting	<i>Passerina amoena</i>	N5B
89	Painted Bunting	<i>Passerina ciris</i>	N5B
90	Bullock's Oriole	<i>Icterus bullockii</i>	N5B
91	Gray-crowned Rosy-Finch	<i>Leucosticte tephrocotis</i>	N5
92	Pine Grosbeak	<i>Pinicola enucleator</i>	N5
93	Hoary Redpoll	<i>Acanthis hornemanni</i>	N5B, N5N
94	Lesser Goldfinch	<i>Spinus psaltria</i>	N5
95	Evening Grosbeak	<i>Coccothraustes vespertinus</i>	N5

Data Deficient Breeding Bird Species – Species evaluated by Bird subcommittee for which insufficient information was available to conduct a conservation status assessment

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing
1	Eastern Screech-owl	<i>Otus asio</i>	SGCN	N5
2	Long-eared Owl	<i>Asio otus</i>	SGCN Threatened	N5B, N5N

Data Deficient Non-Breeding Bird Species – Species evaluated by Bird subcommittee for which insufficient information was available to conduct a conservation status assessment

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing
1	Black Rail	<i>Laterallus jamaicensis</i>	SGCN	N3B, N3N
2	American Tree Sparrow	<i>Spizella arborea</i>	SGCN	N5B, N5N

Presumed Extirpated

	Common Name	Scientific Name	Iowa Status/ Listing	National Rank/Listing	Regionally Important
1	Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	SGCN	N4	11

Appendix 7. List of Iowa Butterflies Evaluated by the IWAP.

Taxonomic order and scientific names derived from: Opler, PA, and AD Warren. 2002. Butterflies of North America. 2. Scientific Names List for Butterfly Species of North America, north of Mexico. CP Gillette Museum of Arthropod Diversity, Department of Bioagricultural Sciences and Pest Management, Colorado State University, Fort Collins, Colorado. 79 pp. This can be accessed at: http://www.biology.ualberta.ca/old_site/uasm/Opler&Warren.pdf

Iowa Status/Listing: **Iowa Status** refers to Species of Greatest Conservation Need (SGCN) status as determined through IWAP species conservation status assessments. **Iowa Listing** refers to Iowa Endangered, Threatened, or Special Concern Status (from Iowa Code Chapter 77) as of 2015. For up-to-date state listing information, please see the Threatened and Endangered Species Program page on the DNR website at www.iowadnr.gov

National Rank/Listing: **National Rank** refers to NatureServe Conservation Status Ranks. N1 = Critically Imperiled in Nation; N2 = Imperiled in Nation; N3 = Vulnerable in Nation; N4 = Apparently Secure in Nation; N5 = Secure in Nation. For additional definitions and explanation see Appendix 14. **National Listing** refers to federally Endangered or Threatened species.

Assessments of species conservation status undertaken as part of the IWAP are used to determine SGCN status only. Other information is provided as a reference. Updates to State Wildlife Action Plans, NatureServe National Ranks, Federal T&E Status, and State T&E Status are each independent processes, undertaken by different entities with differing timeframes. As such, the various listings or status ranks for a given species at a given point in time may not always appear to be in accord.

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
Family: Papilionidae- Swallowtails				
Subfamily: Papilioninae- Swallowtails				
1	Pipevine Swallowtail	<i>Battus philenor</i>	SGCN Special Concern	N5
2	Zebra Swallowtail	<i>Eurytides marcellus</i>	SGCN Special Concern	N5
3	Black Swallowtail	<i>Papilio polyxenes</i>		N5
4	Giant Swallowtail	<i>Papilio cresphontes</i>		N5
5	Eastern Tiger Swallowtail	<i>Papilio glaucus</i>		N5
6	Spicebush Swallowtail	<i>Papilio troilus</i>	SGCN	N4?
Family: Pieridae- Whites and Sulphurs				
Subfamily: Pierinae- Whites				
7	Checkered White	<i>Pontia protodice</i>		N4
8	Olympia Marble	<i>Euchloe olympia</i>	SGCN Special Concern	N4N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
Subfamily: Coliadinae- Sulphurs				
9	Clouded Sulphur	<i>Colias philodice</i>		N5
10	Orange Sulphur	<i>Colias eurytheme</i>		N5
11	Southern Dogface	<i>Zerene cesonia</i>		N5
12	Cloudless Sulphur	<i>Phoebis sennae</i>		N5
13	Little Yellow	<i>Eurema lisa</i>		N5
14	Dainty Sulphur	<i>Nathalis iole</i>		N5
Family: Lycaenidae- Gossamer-wings				
Subfamily: Miletinae- Harvesters				
15	Harvester	<i>Feniseca tarquinius</i>	SGCN	N4
Subfamily: Lycaeninae- Coppers				
16	American Copper	<i>Lycaena phlaeas</i>		N5
17	Gray Copper	<i>Lycaena dione</i>		N5
18	Bronze Copper	<i>Lycaena hyllus</i>		N4N5
19	Purplish Copper	<i>Lycaena helloides</i>	SGCN Special Concern	N5
Subfamily: Theclinae- Hairstreaks				
20	Coral Hairstreak	<i>Satyrrium titus</i>		N4N5
21	Acadian Hairstreak	<i>Satyrrium acadica</i>	SGCN Special Concern	N5
22	Edward's Hairstreak	<i>Satyrrium edwardsii</i>	SGCN Special Concern	N4
23	Banded Hairstreak	<i>Satyrrium calanus</i>		N5
24	Hickory Hairstreak	<i>Satyrrium caryaevorum</i>	SGCN Special Concern	N4
25	Striped Hairstreak	<i>Satyrrium liparops</i>	SGCN Special Concern	N5
26	Henry's Elfin	<i>Callophrys henrici</i>		N5
27	Juniper Hairstreak	<i>Callophrys gryneus</i>		N5
28	White M Hairstreak	<i>Parrhasius m-album</i>	SGCN	N5
29	Gray Hairstreak	<i>Strymon melinus</i>		N5
30	Henry's Elfin	<i>Callophrys henrici</i>	SGCN	N5
Subfamily: Polyommatainae- Blues				
31	Reakirt's Blue	<i>Echinargus isola</i>	SGCN	N5
32	Eastern-tailed Blue	<i>Everes comyntas</i>		N5
33	Spring Azure	<i>Celastrina ladon</i>		N4
34	Summer Azure	<i>Celastrina neglecta</i>		N5
35	Silvery Blue	<i>Glaucopsyche lygdamus</i>	SGCN Threatened	N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
36	Melissa Blue	<i>Plebejus melissa</i>	SGCN	N5
Family: Nymphalidae- Brushfoots				
Subfamily: Libytheinae- Snouts				
37	American Snout	<i>Libytheana carinenta</i>		N5
Subfamily: Heliconiinae- Heliconians and Fritillaries				
38	Variegated Fritillary	<i>Euptoieta claudia</i>		N5
39	Great Spangled Fritillary	<i>Speyeria cybele</i>		N5
40	Aphrodite Fritillary	<i>Speyeria aphrodite</i>	SGCN	N5
41	Regal Fritillary	<i>Speyeria idalia</i>	SGCN Special Concern	N3
42	Silver-bordered Fritillary	<i>Boloria selene</i>	SGCN	N5
43	Meadow Fritillary	<i>Boloria bellona</i>		N5
Subfamily: Nymphalinae- True Brushfoots				
44	Gorgone Checkerspot	<i>Chlosyne gorgone</i>	SGCN	N5
45	Silvery Checkerspot	<i>Chlosyne nycteis</i>		N5
46	Pearl Crescent	<i>Phyciodes tharos</i>		N5
47	Tawny Crescent	<i>Phyciodes batesii</i>	Potentially Extirpated	N3N4
48	Baltimore Checkerspot	<i>Euphydryas phaeton</i>	SGCN Threatened	N4
49	'Ozark' Baltimore Checkerspot	<i>Euphydryas phaeton ozarkae</i>	SGCN Threatened	N3
50	Question Mark	<i>Polygonia interrogationis</i>		N5
51	Eastern Comma	<i>Polygonia comma</i>		N5
52	Gray Comma	<i>Polygonia progne</i>		N4N5
53	Compton Tortoiseshell	<i>Nymphalis vaualbum</i>	SGCN	N5
54	Mourning Cloak	<i>Nymphalis antiopa</i>		N5
55	Milbert's Tortoiseshell	<i>Nymphalis milberti</i>		N5
56	American Lady	<i>Vanessa virginiensis</i>		N5
57	Painted Lady	<i>Vanessa cardui</i>		N5
58	Red Admiral	<i>Vanessa atalanta</i>		N5
59	Common Buckeye	<i>Junonia coenia</i>		N5
Subfamily: Limenitidinae- Admirals and Relatives				
60	Red-spotted Purple	<i>Limenitis arthemis</i>		N5
61	Viceroy	<i>Limenitis archippus</i>		N5
Subfamily: Apaturinae- Emperors				
62	Hackberry Emperor	<i>Asterocampa celtis</i>		N5
63	Tawny Emperor	<i>Asterocampa clyton</i>		N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
Subfamily: Satyrinae- Satyrs				
64	Northern Pearly Eye	<i>Enodia anthedon</i>		N4
65	Eyed Brown	<i>Satyrodes eurydice</i>	SGCN	N4
66	Little Wood Satyr	<i>Megisto cymela</i>		N5
67	Common Ringlet	<i>Coenonympha tullia</i>	SGCN Endangered	N5
68	Common Wood Nymph	<i>Cercyonis pegala</i>		N5
Subfamily: Danainae- Monarchs				
69	Monarch	<i>Danaus plexippus</i>	SGCN	N2N3
Family: Hesperiiidae- Skippers				
Subfamily: Pyrginae- Spread-wing Skippers				
70	Silver-spotted Skipper	<i>Epargyreus clarus</i>		N5
71	Southern Cloudywing	<i>Thorybes bathyllus</i>	SGCN	N5
72	Northern Cloudywing	<i>Thorybes pylades</i>		N5
73	Hayhurst's Scallopwing	<i>Staphylus hayhurstii</i>	SGCN	N5
74	Dreamy Duskywing	<i>Erynnis icelus</i>	SGCN Special Concern	N5
75	Sleepy Duskywing	<i>Erynnis brizo</i>	SGCN Special Concern	N5
76	Juvenal's Duskywing	<i>Erynnis juvenalis</i>	SGCN	N5
77	Horace's Duskywing	<i>Erynnis horatius</i>		N5
78	Mottled Duskywing	<i>Erynnis martialis</i>	SGCN	N3
79	Columbine Duskywing	<i>Erynnis lucilius</i>	SGCN Special Concern	N4
80	Wild Indigo Duskywing	<i>Erynnis baptisiae</i>	Special Concern	N5
81	Common Checkered-Skipper	<i>Pyrgus communis</i>		N5
82	Common Sootywing	<i>Pholisora catullus</i>		N5
Subfamily: Hesperinae- Grass-skipppers				
83	Least Skipper	<i>Ancyloxypha numitor</i>		N5
84	Poweshiek Skipper	<i>Oarisma poweshiek</i>	SGCN Threatened	N1 Endangered
85	European Skipper	<i>Thymelicus lineola</i>		NNA
86	Fiery Skipper	<i>Hylephila phyleus</i>		N5
87	Ottoe Skipper	<i>Hesperia ottoe</i>	SGCN Special Concern	N3N4
88	Leonard's Skipper	<i>Hesperia leonardus</i>	SGCN Special Concern	N4

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
89	Dakota Skipper	<i>Hesperia dacotae</i>	SGCN Endangered	N2 Threatened
90	Peck's Skipper	<i>Polites peckius</i>		N5
91	Tawny-edged Skipper	<i>Polites themistocles</i>		N5
92	Crossline Skipper	<i>Polites origenes</i>	SGCN	N4N5
93	Long Dash	<i>Polites mystic</i>	SGCN	N5
94	Northern Broken-Dash	<i>Wallengrenia egeremet</i>	SGCN	N5
95	Little Glassywing	<i>Pompeius verna</i>	SGCN	N5
96	Sachem	<i>Atalopedes campestris</i>		N5
97	Arogos Skipper	<i>Atrytone arogos</i>	SGCN Special Concern	N3
98	Delaware Skipper	<i>Anatrytone logan</i>		N5
99	Byssus Skipper	<i>Problema byssus</i>	SGCN Threatened	N3N4
100	Mulberry Wing	<i>Poanes massasoit</i>	SGCN Threatened	N4
101	Hobomok Skipper	<i>Poanes hobomok</i>		N5
102	Zabulon Skipper	<i>Poanes zabulon</i>	SGCN Special Concern	N5
103	Broad-winged Skipper	<i>Poanes viator</i>	Special Concern	N5
104	Dion Skipper	<i>Euphyes dion</i>	SGCN Special Concern	N4
105	Black Dash	<i>Euphyes conspicua</i>	SGCN	N4
106	Two-spotted Skipper	<i>Euphyes bimacula</i>	SGCN Special Concern	N4
107	Dun Skipper	<i>Euphyes vestris</i>		N5
108	Dusted Skipper	<i>Atrytonopsis hianna</i>	SGCN Special Concern	N4N5
109	Pepper and Salt Skipper	<i>Amblyscirtes hegon</i>	SGCN Special Concern	N5
110	Common Roadside-Skipper	<i>Amblyscirtes vialis</i>	SGCN	N4
111	Swarthy skipper	<i>Nastra lherminier</i>	SGCN	N5

Data Deficient Species – Species evaluated by butterfly subcommittee for which insufficient information was available to conduct a conservation status assessment

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
1	White M. Hairstreak	<i>Parrhasius m-album</i>	SGCN	N5
2	'Ozark' Baltimore Checkerspot	<i>Euphydryas phaeton ozarkae</i>	SGCN Threatened	N3
3	Hayhurst's Scallopwing	<i>Staphylus hayhurstii</i>	SGCN	N5

4	Dreamy Duskywing	<i>Erynnis icelus</i>	SGCN Special Concern	N5
5	Common Roadside-skipper	<i>Amblyscirtes vialis</i>	SGCN	N4
6	Swarthy Skipper	<i>Nastra lherminier</i>	SGCN	N5

Vagrant Species - These species are considered stray or vagrant in Iowa. They have confirmed documentation of occurrence in the state but do not have established populations within Iowa. In some years, populations of these species expand into portions of the state.

	Common Name	Scientific Name
1	White Admiral	<i>Limenitis arthemis</i>
2	Sleepy Orange	<i>Eurema nicippe</i>
3	Mexican Yellow	<i>Eurema mexicana</i>
4	Marine Blue	<i>Leptotes marina</i>
5	Red-banded Hairstreak	<i>Calycopis cecrops</i>
6	Queen	<i>Danaus gilippus</i>
7	Gulf Fritillary	<i>Agraulis vanillae</i>
8	Hoary Edge	<i>Achalarus lyciades</i>
9	Persius Duskywing	<i>Erynnis persius</i>
10	Funereal Duskywing	<i>Erynnis funeralis</i>
11	Eufala Skipper	<i>Lerodea eufala</i>
12	Goatweed Leafwing	<i>Anaea andria</i>

Introduced Species - These species have established breeding populations within the state of Iowa but were excluded from consideration as SGCN due to the fact that they were introduced to Iowa by humans.

	Common Name	Scientific Name
1	Cabbage White	<i>Pieris rapae</i>
2	European Skipper	<i>Thymelicus lineola</i>

Removed from List of Iowa Species

Common Name	Scientific Name	Explanation
Swamp Metalmark	<i>Calephelis muticum</i>	The single record for Iowa has since been determined to be in error.
Greenish Blue	<i>Plebejus saepiolus</i>	Unclear why this was included in initial plan
Uncas Skipper	<i>Hesperia uncas</i>	Unclear why this was included in initial plan

Appendix 8. List of Iowa Crayfish Evaluated by the IWAP

Taxonomic order and scientific names derived from: NatureServe Explorer.

Iowa Status/Listing: **Iowa Status** refers to Species of Greatest Conservation Need (SGCN) status as determined through IWAP species conservation status assessments. **Iowa Listing** refers to Iowa Endangered, Threatened, or Special Concern Status (from Iowa Code Chapter 77) as of 2015. For up-to-date state listing information, please see the Threatened and Endangered Species Program page on the DNR website at www.iowadnr.gov

National Rank/Listing: **National Rank** refers to NatureServe Conservation Status Ranks. N1 = Critically Imperiled in Nation; N2 = Imperiled in Nation; N3 = Vulnerable in Nation; N4 = Apparently Secure in Nation; N5 = Secure in Nation. For additional definitions and explanation see Appendix 14. **National Listing** refers to federally Endangered or Threatened species.

Assessments of species conservation status undertaken as part of the IWAP are used to determine SGCN status only. Other information is provided as a reference. Updates to State Wildlife Action Plans, NatureServe National Ranks, Federal T&E Status, and State T&E Status are each independent processes, undertaken by different entities with differing timeframes. As such, the various listings or status ranks for a given species at a given point in time may not always appear to be in accord.

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
8	Devil Crayfish	<i>Cambarus diogenes</i>	SGCN	N5
9	Calico Crayfish	<i>Orconectes immunis</i>	SGCN	N5
10	Golden Crayfish	<i>Orconectes luteus</i>	SGCN	N5
11	Northern Clearwater Crayfish	<i>Orconectes propinquus</i>	SGCN	N5
12	Virile Crayfish	<i>Orconectes virilis</i>	SGCN	N5
13	Prairie Crayfish	<i>Procambarus gracilis</i>	SGCN	N5
14	White River Crayfish	<i>Procambrus acutus</i>	SGCN	NNR

Exotic Species - Species evaluated by Plan authors for which a conservation status assessment was not conducted due to non-native status in Iowa

	Common Name	Scientific Name
1	Rusty Crayfish	<i>Orconectes rusticus</i>

Appendix 9. List of Iowa Dragonflies & Damselflies Evaluated by the IWAP.

Taxonomic order and scientific names derived from: Paulson, DR, and SW Dunkle, eds. 2009. *A Checklist of North American Odonata*. Accessed at: http://www.odonatacentral.org/docs/NA_Odonata_Checklist_2009.pdf

Iowa Status: refers to Species of Greatest Conservation Need (SGCN) status as determined through IWAP species conservation status assessments. As of 2015, no Dragonfly or Damselfly species have been included in Iowa's list of species having Endangered, Threatened, or Special Concern Status (from Iowa Code Chapter 77). For up-to-date state listing information, please see the Threatened and Endangered Species Program page on the DNR website at www.iowadnr.gov

National Rank/Listing: National Rank refers to NatureServe Conservation Status Ranks. N1 = Critically Imperiled in Nation; N2 = Imperiled in Nation; N3 = Vulnerable in Nation; N4 = Apparently Secure in Nation; N5 = Secure in Nation. For additional definitions and explanation see Appendix 14. **National Listing** refers to federally Endangered or Threatened species.

Assessments of species conservation status undertaken as part of the IWAP are used to determine SGCN status only. Other information is provided as a reference. Updates to State Wildlife Action Plans, NatureServe National Ranks, Federal T&E Status, and State T&E Status are each independent processes, undertaken by different entities with differing timeframes. As such, the various listings or status ranks for a given species at a given point in time may not always appear to be in accord.

	Common Name	Scientific Name	Iowa Status	National Rank/Listing
Broad-winged damselflies: Calopterygidae				
1	River Jewelwing	<i>Calopteryx aequabilis</i>		N5
2	Ebony Jewelwing	<i>Calopteryx maculata</i>		N5
3	American Rubyspot	<i>Hetaerina americana</i>		N5
4	Smoky Rubyspot	<i>Hetaerina titia</i>		N5
Spreadwings: Lestidae				
5	Great Spreadwing	<i>Archilestes grandis</i>		N5
6	Southern Spreadwing	<i>Lestes australis</i>		N5
7	Spotted Spreadwing	<i>Lestes congener</i>	SGCN	N5
8	Emerald Spreadwing	<i>Lestes dryas</i>		N5
9	Amber-winged Spreadwing	<i>Lestes eurinus</i>	SGCN	N4
10	Sweetflag Spreadwing	<i>Lestes forcipatus</i>	SGCN	N5
11	Elegant Spreadwing	<i>Lestes inaequalis</i>		N5
12	Slender Spreadwing	<i>Lestes rectangularis</i>		N5
13	Lyre-tipped Spreadwing	<i>Lestes unguiculatus</i>		N5
Pond Damselflies: Coenagrionidae				
14	Eastern Red Damselfly	<i>Amphiagrion saucium</i>		N5

	Common Name	Scientific Name	Iowa Status	National Rank/Listing
15	Paiute Dancer	<i>Argia alberta</i>	SGCN	N4
16	Blue-fronted Dancer	<i>Argia apicalis</i>		N5
17	Variable (Violet) Dancer	<i>Argia fumipennis</i>		N5
18	Powdered Dancer	<i>Argia moesta</i>		N5
19	Springwater Dancer	<i>Argia plana</i>	SGCN	N5
20	Blue-tipped Dancer	<i>Argia tibialis</i>		N5
21	Prairie Bluet	<i>Coenagrion angulatum</i>	SGCN	N3?
22	Taiga Bluet	<i>Coenagrion resolutum</i>	SGCN	N5
23	River Bluet	<i>Enallagma anna</i>		N5
24	Northern Bluet	<i>Enallagma annexum</i>		N5
25	Rainbow Bluet	<i>Enallagma antennatum</i>		N5
26	Azure Bluet	<i>Enallagma aspersum</i>		N5
27	Double-striped Bluet	<i>Enallagma basidens</i>		N5
28	Boreal Bluet	<i>Enallagma boreale</i>	SGCN	N5
29	Tule Bluet	<i>Enallagma carunculatum</i>		N5
30	Familiar Bluet	<i>Enallagma civile</i>		N5
31	Alkali Bluet	<i>Enallagma clausum</i>	SGCN	N5
32	Marsh Bluet	<i>Enallagma ebrium</i>		N5
33	Stream Bluet	<i>Enallagma exsulans</i>		N5
34	Skimming Bluet	<i>Enallagma geminatum</i>		N5
35	Hagen's Bluet	<i>Enallagma hageni</i>		N5
36	Orange Bluet	<i>Enallagma signatum</i>		N5
37	Slender Bluet	<i>Enallagma traviatum</i>		N5
38	Vesper Bluet	<i>Enallagma vesperum</i>		N5
39	Citrine Forktail	<i>Ischnura hastata</i>		N5
40	Western Forktail	<i>Ischnura perparva</i>	SGCN	N5
41	Fragile Forktail	<i>Ischnura posita</i>		N5
42	Eastern Forktail	<i>Ischnura verticalis</i>		N5
43	Sedge Sprite	<i>Nehalennia irene</i>	SGCN	N5
Darners: Aeshnidae				
44	Canada Darner	<i>Aeshna canadensis</i>	SGCN	N5
45	Lance-tipped Darner	<i>Aeshna constricta</i>		N5
46	Variable Darner	<i>Aeshna interrupta</i>	SGCN	N5
47	Shadow Darner	<i>Aeshna umbrosa</i>		N5
48	Common Green Darner	<i>Anax junius</i>		N5
49	Fawn Darner	<i>Boyeria vinosa</i>		N5
50	Swamp Darner	<i>Epiaeschna heros</i>		N5
51	Cyrano Darner	<i>Nasiaeschna pentacantha</i>		N5

	Common Name	Scientific Name	Iowa Status	National Rank/Listing
52	Blue-eyed Darner	<i>Rhionaeshna multicolor</i>		N5
Clubtails: Gomphidae				
53	Horned Clubtail	<i>Arigomphus cornutus</i>		N4
54	Jade Clubtail	<i>Arigomphus submedianus</i>		N5
55	Flag-tailed Spinyleg	<i>Dromogomphus spoliatus</i>		N4N5
56	Plains Clubtail	<i>Gomphus externus</i>		N5
57	Midland Clubtail	<i>Gomphus fraternus</i>	SGCN	N5
58	Pronghorn Clubtail	<i>Gomphus graslinellus</i>		N5
59	Sulphur-tipped Clubtail	<i>Gomphus militaris</i>	SGCN	N5
60	Rapids Clubtail	<i>Gomphus quadricolor</i>	SGCN	N3N4
61	Cobra Clubtail	<i>Gomphus vastus</i>		N5
62	Rusty Snaketail	<i>Ophiogomphus rupinsulensis</i>	SGCN	N5
63	Pale Snaketail	<i>Ophiogomphus severus</i>	SGCN	N5
64	Sioux Snaketail	<i>Ophiogomphus smithi</i>	SGCN	N2
65	Westfall's Snaketail	<i>Ophiogomphus westfalli</i>	SGCN	N3
66	Common Sanddragon	<i>Progomphus obscurus</i>		N5
67	Riverine Clubtail	<i>Stylurus amnicola</i>		N4
68	Brimstone Clubtail	<i>Stylurus intricatus</i>	SGCN	N4
69	Elusive Clubtail	<i>Stylurus notatus</i>	SGCN	N3
70	Russet-tipped Clubtail	<i>Stylurus plagiatus</i>		N5
71	Arrow Clubtail	<i>Stylurus spiniceps</i>	SGCN	N4
Cruisers: Macromidae				
72	Stream Cruiser	<i>Didymops transversa</i>	SGCN	N5
73	Swift (Illinois) River Cruiser	<i>Macromia illinoensis</i>		N5
74	Royal River Cruiser	<i>Macromia taeniolata</i>	SGCN	N5
Emeralds: Corduliidae				
75	Slender Baskettail	<i>Epitheca costalis</i>	SGCN	N5
76	Common Baskettail	<i>Epitheca cynosura</i>		N5
77	Prince Baskettail	<i>Epitheca princeps</i>		N5
78	Smoky Shadowdragon	<i>Neurocordulia molesta</i>	SGCN	N4
79	Stygian Shadowdragon	<i>Neurocordulia yamaskanensis</i>	SGCN	N5
80	Plains Emerald	<i>Somatochlora ensigera</i>	SGCN	N4
81	Mocha Emerald	<i>Somatochlora linearis</i>		N5
Skimmers: Libellulidae				
82	Calico Pennant	<i>Celithemis elisa</i>		N5
83	Halloween Pennant	<i>Celithemis eponina</i>		N5
84	Eastern Pondhawk	<i>Erythemis simplicicollis</i>		N5

	Common Name	Scientific Name	Iowa Status	National Rank/Listing
85	Dot-tailed Whiteface	<i>Leucorrhinia intacta</i>		N5
86	Spangled Skimmer	<i>Libellula cyanea</i>		N5
87	Slaty Skimmer	<i>Libellula incesta</i>		N5
88	Widow Skimmer	<i>Libellula luctuosa</i>		N5
89	Twelve-spotted Skimmer	<i>Libellula pulchella</i>		N5
90	Four-spotted Skimmer	<i>Libellula quadrimaculata</i>		N5
91	Blue Dasher	<i>Pachydiplax longipennis</i>		N5
92	Wandering Glider	<i>Pantala flavescens</i>		N5
93	Spot-winged Glider	<i>Pantala hymenaea</i>		N5
94	Eastern Amberwing	<i>Perithemis tenera</i>		N5
95	Common Whitetail	<i>Plathemis lydia</i>		N5
96	Blue-faced Meadowhawk	<i>Sympetrum ambiguum</i>		N5
97	Variegated Meadowhawk	<i>Sympetrum corruptum</i>		N5
98	Saffron-winged Meadowhawk	<i>Sympetrum costiferum</i>		N5
99	Black Meadowhawk	<i>Sympetrum danae</i>		N5
100	Cherry-faced Meadowhawk	<i>Sympetrum internum</i>		N5
101	White-faced Meadowhawk	<i>Sympetrum obtrusum</i>		N5
102	Ruby Meadowhawk	<i>Sympetrum rubicundulum</i>		N5
103	Band-winged (Western) Meadowhawk	<i>Sympetrum semicinctum</i> (sub species = <i>occidentale</i>)		N5
104	Autumn Meadowhawk	<i>Sympetrum vicinum</i>		N5
105	Carolina Saddlebags	<i>Tamea carolina</i>	SGCN	N5
106	Black Saddlebags	<i>Tamea lacerata</i>		N5
107	Red Saddlebags	<i>Tamea onusta</i>		N5

Data Deficient Species - Species evaluated by Dragonfly & Damselfly subcommittee for which insufficient information was available to conduct a conservation status assessment.

	Common Name	Scientific Name	Iowa Status	National Rank/Listing	Explanation
1	Prairie Bluet	<i>Coenagrion angulatum</i>	SGCN	N3?	Minimal records and poorly documented range
2	Taiga Bluet	<i>Coenagrion resolutum</i>	SGCN	N5	Iowa at southern portion of range
3	Boreal Bluet	<i>Enallagma boreale</i>	SGCN	N5	Minimal records
4	Alkali Bluet	<i>Enallagma clausum</i>	SGCN	N5	
5	Western Forktail	<i>Ischnura perparva</i>	SGCN	N5	Only found in one county – IA is extreme eastern edge of range
6	Canada Darner	<i>Aeshna canadensis</i>	SGCN	N5	Minimal records and poorly

	Common Name	Scientific Name	Iowa Status	National Rank/Listing	Explanation
					documented historical range – IA is southern edge of range
7	Variable Darner	<i>Aeshna interrupta</i>	SGCN	N5	IA is on southeast edge of range
8	Rapids Clubtail	<i>Gomphus quadricolor</i>	SGCN	N3N4	Limited distribution – nymphs found in NE IA
9	Pale Snaketail	<i>Ophiogomphus severus</i>	SGCN	N5	Reliably found in only one location in IA
10	Westfall's Snaketail	<i>Ophiogomphus westfalli</i>	SGCN	N3	Only documented in small numbers in Boone River – Normal species range in Ozarks
11	Brimstone Clubtail	<i>Stylurus intricatus</i>	SGCN	N4	Minimal historical record
12	Arrow Clubtail	<i>Stylurus spiniceps</i>	SGCN	N4	Only one adult record and few nymphs
13	Slender Baskettail	<i>Epitheca costalis</i>	SGCN	N5	No historical record
14	Stygian Shadowdragon	<i>Neurocordulia yamaskanensis</i>	SGCN	S5	No adults documented in IA - Difficult to survey: flies after dusk
15	Carolina Saddlebags	<i>Tamea carolina</i>	SGCN	N5	Only reliably documented in one location

Vagrant Species - These species are considered stray or vagrant in Iowa. They have confirmed documentation of occurrence in the state but do not have established populations within Iowa. In some years, populations of these species expand into portions of the state.

	Common Name	Scientific Name	Iowa Status	National Rank/Listing	Explanation
1	Emma's Dancer	<i>Argia emma</i>		N5	Only seen once in a single location
2	Black-tipped Darner	<i>Aeshna tuberculifera</i>		N4	
3	Green-striped Darner	<i>Aeshna verticalis</i>		N5	
4	Spatardock Darner	<i>Rhionaeshna mutata</i>		N4	Only recorded once
5	Golden-winged Skimmer	<i>Libellula auripennis</i>		N5	Few specimens
6	Painted Skimmer	<i>Libellula semifasciata</i>		N5	Only documented in two locations – no established population
7	Great Blue Skimmer	<i>Libellula vibrans</i>		N5	Only documented in one location – no established population
8	Striped Saddlebags	<i>Tamea calverti</i>		NNR	Southern stray – no

	Common Name	Scientific Name	Iowa Status	National Rank/Listing	Explanation
					established population

Appendix 10. List of Iowa Fish Evaluated by the IWAP.

Taxonomy from: Page, LM, H Espinosa-Perez, LT Findley, CR Gilbert, RN Lea, NE Mandrak, RL Mayden, and JS Nelson. 2013. **Common and scientific names of fishes from:** the United States, Canada, and Mexico, 7th Edition. American Fisheries Society, Special Publication 34, Bethesda, MD.

Iowa Status/Listing: **Iowa Status** refers to Species of Greatest Conservation Need (SGCN) status as determined through IWAP species conservation status assessments. **Iowa Listing** refers to Iowa Endangered, Threatened, or Special Concern Status (from Iowa Code Chapter 77) as of 2015. For up-to-date state listing information, please see the Threatened and Endangered Species Program page on the DNR website at www.iowadnr.gov

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	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
Lampreys: Petromyzontidae				
1	Chestnut lamprey	<i>Ichthyomyzon castaneus</i>	SGCN Threatened	N4
2	Northern brook lamprey	<i>Ichthyomyzon fossor</i>	SGCN	N4
3	Silver lamprey	<i>Ichthyomyzon unicuspis</i>	SGCN	N5
4	American brook lamprey	<i>Lethenteron appendix</i>	SGCN Threatened	N4
Sturgeons: Acipenseridae				
5	Lake sturgeon	<i>Acipenser fulvescens</i>	SGCN Endangered	N3N4
6	Pallid sturgeon	<i>Scaphirhynchus albus</i>	SGCN Endangered	N2 Endangered
7	Shovelnose sturgeon	<i>Scaphirhynchus platyrhynchus</i>	SGCN	N4 Threatened*
Paddlefishes: Polyodontidae				
8	Paddlefish	<i>Polyodon spathula</i>	SGCN	N4
Gars: Lepisosteidae				
9	Spotted gar	<i>Lepisosteus oculatus</i>		N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
10	Longnose gar	<i>Lepisosteus osseus</i>		N5
11	Shortnose gar	<i>Lepisosteus platostomus</i>		N5
Bowfins: Amiidae				
12	Bowfin	<i>Amia calva</i>		N5
Mooneyes: Hiodontidae				
13	Goldeye	<i>Hiodon alosoides</i>		N5
14	Mooneye	<i>Hiodon tergisus</i>		N5
Freshwater eels: Anguillidae				
15	American eel	<i>Anguilla rostrata</i>	SGCN	N4
Herrings: Clupeidae				
16	Skipjack herring	<i>Alosa chrysochloris</i>	SGCN	N5
17	Gizzard shad	<i>Dorosoma cepedianum</i>		N5
18	Alabama shad	<i>Alosa alabamae</i>		N3
Carp and minnows: Cyprinidae				
19	Central stoneroller	<i>Campostoma anomalum</i>		N5
20	Largescale stoneroller	<i>Campostoma oligolepis</i>	SGCN	N5
21	Southern redbelly dace	<i>Chrosomus erythrogaster</i>		N5
22	Redside dace	<i>Clinostomus elongatus</i>		N3N4
23	Lake chub	<i>Couesius plumbeus</i>		N5
24	Red shiner	<i>Cyprinella lutrensis</i>		N5
25	Spotfin shiner	<i>Cyprinella spiloptera</i>		N5
26	Gravel chub	<i>Erimystax x-punctatus</i>	SGCN	N4
27	Western silvery minnow	<i>Hybognathus argyritis</i>	SGCN	N4
28	Brassy minnow	<i>Hybognathus hankinsoni</i>		N5
29	Mississippi silvery minnow	<i>Hybognathus nuchalis</i>	SGCN	N5
30	Plains minnow	<i>Hybognathus placitus</i>	SGCN	N4
31	Pallid shiner	<i>Hybopsis amnis</i>	SGCN	N4
32	Common shiner	<i>Luxilus cornutus</i>		N5
33	Redfin shiner	<i>Lythrurus umbratilis</i>	SGCN	N5
34	Shoal chub	<i>Macrhybopsis hyostoma</i>	SGCN	N5
35	Sturgeon chub	<i>Macrhybopsis gelida</i>	SGCN	N3
36	Sicklefin chub	<i>Macrhybopsis meeki</i>	SGCN	N3
37	Silver chub	<i>Macrhybopsis storeriana</i>		N5
38	Pearl dace	<i>Margariscus margarita</i>	SGCN Endangered	N5
39	Hornyhead chub	<i>Nocomis biguttatus</i>		N5
40	Golden shiner	<i>Notemigonus crysoleucas</i>	SGCN	N5
41	Pugnose shiner	<i>Notropis anogenus</i>	SGCN Endangered	N3

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
42	Emerald shiner	<i>Notropis atherinoides</i>		N5
43	River shiner	<i>Notropis blennioides</i>	SGCN	N5
44	Silverband shiner	<i>Notropis shumardi</i>	SGCN	N5
45	Ghost shiner	<i>Notropis buchanani</i>	SGCN	N5
46	Ironcolor shiner	<i>Notropis chalybaeus</i>		N4
47	Bigmouth shiner	<i>Notropis dorsalis</i>		N5
48	Blackchin shiner	<i>Notropis heterodon</i>		N5
49	Blacknose shiner	<i>Notropis heterolepis</i>	SGCN Threatened	N4
50	Spottail shiner	<i>Notropis hudsonius</i>		N5
51	Ozark minnow	<i>Notropis nubilus</i>	SGCN	N5
52	Carmine shiner	<i>Notropis percobromus</i>	SGCN	N5
53	Sand shiner	<i>Notropis stramineus</i>		N5
54	Weed shiner	<i>Notropis texanus</i>	SGCN Endangered	N5
55	Topeka shiner	<i>Notropis topeka</i>	SGCN Threatened	N3 Endangered
56	Mimic shiner	<i>Notropis volucellus</i>	SGCN	N5
57	Channel shiner	<i>Notropis wickliffi</i>	SGCN	N5
58	Pugnose minnow	<i>Opsopoeodus emiliae</i>	SGCN	N5
59	Suckermouth minnow	<i>Phenacobius mirabilis</i>	SGCN	N5
60	Southern redbelly dace	<i>Chrosomus erythrogaster</i>	SGCN	N5
61	Bluntnose minnow	<i>Pimephales notatus</i>		N5
62	Fathead minnow	<i>Pimephales promelas</i>		N5
63	Bullhead minnow	<i>Pimephales vigilax</i>		N5
64	Flathead chub	<i>Platygobio gracilis</i>	SGCN	N5
65	Blacknose dace	<i>Rhinichthys atratulus</i>		N5
66	Longnose dace	<i>Rhinichthys cataractae</i>	SGCN	N5
67	Creek chub	<i>Semotilus atromaculatus</i>		N5
Suckers: Catostomidae				
68	River carpsucker	<i>Carpionodes carpio</i>		N5
69	Quillback	<i>Carpionodes cyprinus</i>		N5
70	Highfin carpsucker	<i>Carpionodes velifer</i>		N4N5
71	White sucker	<i>Catostomus commersonii</i>		N5
72	Blue sucker	<i>Cycleptus elongatus</i>	SGCN	N3
73	Lake chubsucker	<i>Erimyzon sucetta</i>	SGCN	N5
74	Northern hog sucker	<i>Hypentelium nigricans</i>		N5
75	Smallmouth buffalo	<i>Ictiobus bubalus</i>		N5
76	Bigmouth buffalo	<i>Ictiobus cyprinellus</i>		N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
77	Black buffalo	<i>Ictiobus niger</i>	SGCN	N5
78	Spotted sucker	<i>Minytrema melanops</i>	SGCN	N5
79	Silver redhorse	<i>Moxostoma anisurum</i>		N5
80	River redhorse	<i>Moxostoma carinatum</i>	SGCN	N4
81	Black redhorse	<i>Moxostoma duquesnei</i>	SGCN Threatened	N5
82	Golden redhorse	<i>Moxostoma erythrurum</i>		N5
83	Shorthead redhorse	<i>Moxostoma macrolepidotum</i>		N5
North American catfishes: Ictaluridae				
84	Black bullhead	<i>Ameiurus melas</i>		N5
85	Yellow bullhead	<i>Ameiurus natalis</i>		N5
86	Brown bullhead	<i>Ameiurus nebulosus</i>	SGCN	N5
87	Blue catfish	<i>Ictalurus furcatus</i>	SGCN	N5
88	Channel catfish	<i>Ictalurus punctatus</i>		N5
89	Slender madtom	<i>Noturus exilis</i>	SGCN	N5
90	Stonecat	<i>Noturus flavus</i>		N5
91	Tadpole madtom	<i>Noturus gyrinus</i>	SGCN	N5
92	Freckled madtom	<i>Noturus nocturnus</i>	SGCN Endangered	N5
93	Flathead catfish	<i>Pylodictis olivaris</i>		N5
Pikes: Esocidae				
94	Redfin pickerel	<i>Esox americanus</i>	SGCN Threatened	N5
95	Northern pike	<i>Esox lucius</i>	SGCN	N5
96	Muskellunge	<i>Esox masquinongy</i>		N5
Mudminnows: Umbridae				
97	Central mudminnow	<i>Umbra limi</i>	SGCN	N5
Smelts: Osmeridae				
98	Rainbow smelt	<i>Osmerus mordax</i>		N5
Trouts and salmons: Salmonidae				
99	Brook trout	<i>Salvelinus fontinalis</i>	SGCN	N5
Trout-perches: Percopsidae				
100	Trout-perch	<i>Percopsis omiscomaycus</i>	SGCN	N5
Pirate perches: Aphredoderidae				
101	Pirate perch	<i>Aphredoderus sayanus</i>	SGCN	N5
Cods: Gadidae				
102	Burbot	<i>Lota lota</i>	SGCN Threatened	N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
New World silversides: Atherinopsidae				
103	Brook silverside	<i>Labidesthes sicculus</i>	SGCN	N5
Topminnows: Fundulidae				
104	Banded killifish	<i>Fundulus diaphanus</i>	SGCN	N5
105	Starhead topminnow	<i>Fundulus dispar</i>	SGCN	N4
106	Blackstripe topminnow	<i>Fundulus notatus</i>	SGCN	N5
107	Plains topminnow	<i>Fundulus sciadicus</i>	SGCN	N4
Livebearers: Poeciliidae				
108	Western mosquitofish	<i>Gambusia affinis</i>		N5
Sticklebacks: Gasterosteidae				
109	Brook stickleback	<i>Culaea inconstans</i>		N5
Sculpins: Cottidae				
110	Mottled sculpin	<i>Cottus bairdii</i>	SGCN	N5
111	Slimy sculpin	<i>Cottus cognatus</i>	SGCN	N5
Temperate basses: Moronidae				
112	White perch	<i>Morone americana</i>		N5
113	White bass	<i>Morone chrysops</i>		N5
114	Yellow bass	<i>Morone mississippiensis</i>		N5
Sunfishes: Centrarchidae				
115	Rock Bass	<i>Ambloplites rupestris</i>	SGCN	N5
116	Green sunfish	<i>Lepomis cyanellus</i>		N5
117	Pumpkinseed	<i>Lepomis gibbosus</i>		N5
118	Warmouth	<i>Lepomis gulosus</i>		N5
119	Orangespotted sunfish	<i>Lepomis humilis</i>		N5
120	Bluegill	<i>Lepomis macrochirus</i>		N5
121	Longear sunfish	<i>Lepomis megalotis</i>	SGCN	N5
122	Redear sunfish	<i>Lepomis microlophus</i>		N5
123	Smallmouth bass	<i>Micropterus dolomieu</i>		N5
124	Spotted bass	<i>Micropterus punctulatus</i>		N5
125	Largemouth bass	<i>Micropterus salmoides</i>		N5
126	White crappie	<i>Pomoxis annularis</i>		N5
127	Black crappie	<i>Pomoxis nigromaculatus</i>		N5
Perches: Percidae				
128	Western sand darter	<i>Ammocrypta clara</i>	SGCN Threatened	N3
129	Crystal darter	<i>Crystallaria asprella</i>	SGCN	N3
130	Mud darter	<i>Etheostoma asprigene</i>	SGCN	N4
131	Rainbow darter	<i>Etheostoma caeruleum</i>	SGCN	N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
132	Bluntnose darter	<i>Etheostoma chlorosoma</i>	SGCN Endangered	N5
133	Iowa darter	<i>Etheostoma exile</i>	SGCN	N5
134	Fantail darter	<i>Etheostoma flabellare</i>		N5
135	Least darter	<i>Etheostoma microperca</i>	SGCN Endangered	N5
136	Johnny darter	<i>Etheostoma nigrum</i>		N5
137	Orangethroat darter	<i>Etheostoma spectabile</i>	SGCN Threatened	N5
138	Banded darter	<i>Etheostoma zonale</i>	SGCN	N5
139	Yellow perch	<i>Perca flavescens</i>		N5
140	Logperch	<i>Percina caprodes</i>	SGCN	N5
141	Gilt darter	<i>Percina evides</i>		N4
142	Blackside darter	<i>Percina maculata</i>	SGCN	N5
143	Slenderhead darter	<i>Percina phoxocephala</i>	SGCN	N5
144	River darter	<i>Percina shumardi</i>	SGCN	N5
145	Sauger	<i>Sander canadensis</i>		N5
146	Walleye	<i>Sander vitreus</i>		N5
Drums and croakers: Sciaenidae				
147	Freshwater drum	<i>Aplodinotus grunniens</i>		N5

*In 2010 the Shovelnose Sturgeon was listed as Threatened under the Similarity of Appearance Provisions of the Endangered Species Act. The purpose of this is to protect pallid sturgeon by treating shovelnose sturgeon as a threatened species where their ranges overlap.

Data Deficient Species – Species evaluated by fish subcommittee for which insufficient information was available to conduct a conservation status assessment

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
1	Mimic shiner	<i>Notropis volucellus</i>		N5
2	Channel shiner	<i>Notropis wickliffi</i>		N5
3	Lake chubsucker	<i>Erimyzon succetta</i>		N5
4	Bluntnose darter	<i>Etheostoma chlorosomum</i>	SGCN Endangered	N5
5	Orangethroat darter	<i>Etheostoma spectabile</i>	SGCN Threatened	N5

Exotic Species – Species evaluated by fish subcommittee for which a conservation status assessment was not conducted due to non-native status in Iowa

	Common Name	Scientific Name
1	Goldfish	<i>Carassius auratus</i>
2	Grass carp	<i>Ctenopharyngodon idella</i>
3	Common carp	<i>Cyprinus carpio</i>

	Common Name	Scientific Name
4	Silver carp	<i>Hypophthalmichthys molitrix</i>
5	Bighead carp	<i>Hypophthalmichthys nobilis</i>
6	Rainbow trout	<i>Oncorhynchus mykiss</i>
7	Brown trout	<i>Salmo trutta</i>
8	Spotted bass	<i>Micropterus punctulatus</i>
9	Striped bass	<i>Morone saxatilis</i>

Presumed Extirpated

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
1	Alabama shad	<i>Alosa alabamae</i>		N3
2	Redside dace	<i>Clinostomus elongatus</i>		N3N4
3	Lake chub	<i>Couesius plumbeus</i>		N5
4	Ironcolor shiner	<i>Notropis chalybaeus</i>		N4
5	Blackchin shiner	<i>Notropis heterodon</i>		N5
6	Blacknose shiner	<i>Notropis heterolepis</i>	Threatened	N4
7	Gilt darter	<i>Percina evides</i>		N4

Removed From List of Iowa Species

	Common Name	Scientific Name	Explanation
1	Greater redhorse	<i>Moxostoma valenciennesi</i>	There is no current or historical evidence that this species ever occurred in Iowa or along the Iowa portion of the Upper Mississippi River

Appendix 11. List of Mammals Evaluated by the IWAP.

Taxonomic order derived from: Mammal Species of the World, used by the Smithsonian Institution’s National Museum of Natural History, which can be accessed at: <http://www.mnh.si.edu/> Reference: Wilson, DE and DM Reeder (editors). 2005. Mammal Species of the World: A Taxonomic and Geographic Reference (3rd Ed.) Johns Hopkins University Press. 2,142 pp.

Iowa Status/Listing: **Iowa Status** refers to Species of Greatest Conservation Need (SGCN) status as determined through IWAP species conservation status assessments. **Iowa Listing** refers to Iowa Endangered, Threatened, or Special Concern Status (from Iowa Code Chapter 77) as of 2015. For up-to-date state listing information, please see the Threatened and Endangered Species Program page on the DNR website at www.iowadnr.gov

National Rank/Listing: **National Rank** refers to NatureServe Conservation Status Ranks. N1 = Critically Imperiled in Nation; N2 = Imperiled in Nation; N3 = Vulnerable in Nation; N4 = Apparently Secure in Nation; N5 = Secure in Nation. For additional definitions and explanation see Appendix 14. **National Listing** refers to federally Endangered or Threatened species.

Assessments of species conservation status undertaken as part of the IWAP are used to determine SGCN status only. Other information is provided as a reference. Updates to State Wildlife Action Plans, NatureServe National Ranks, Federal T&E Status, and State T&E Status are each independent processes, undertaken by different entities with differing timeframes. As such, the various listings or status ranks for a given species at a given point in time may not always appear to be in accord.

Native, Extant Species

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
1	Virginia opossum	<i>Didelphis virginiana</i>		N5
2	Hayden's Shrew	<i>Sorex haydeni</i>	SGCN	N4
3	Northern short-tailed shrew	<i>Blarina brevicauda</i>		N5
4	Southern Short-tailed Shrew	<i>Blarina carolinensis</i>	SGCN	N5
5	Elliot’s Short-tailed Shrew	<i>Blarina hylophaga</i>	SGCN	N5
6	Least shrew	<i>Cryptotis parva</i>	SGCN Threatened	N5
7	Cinereus (Masked) shrew	<i>Sorex cinereus</i>		N5
8	Eastern mole	<i>Scalopus aquaticus</i>		N5
9	Northern long-eared bat	<i>Myotis septentrionalis</i>	SGCN	N1N2 Threatened
10	Little brown bat	<i>Myotis lucifugus</i>	SGCN	N3
11	Indiana bat	<i>Myotis sodalis</i>	SGCN Endangered	N2 Endangered
12	Silver-haired bat	<i>Lasionycteris noctivagans</i>	SGCN	N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
13	Tri-colored bat (formerly Eastern pipistrelle)	<i>Perimyotis subflavus</i>	SGCN	N5
14	Big brown bat	<i>Eptesicus fuscus</i>		N5
15	Red bat	<i>Lasiurus borealis</i>		N5
16	Hoary bat	<i>Lasiurus cinereus</i>		N5
17	Evening Bat	<i>Nycticeius humeralis</i>	SGCN	N5
18	Eastern cottontail	<i>Sylvilagus floridanus</i>		N5
19	White-tailed jackrabbit	<i>Lepus townsendii</i>	SGCN	N5
20	Coyote	<i>Canis latrans</i>		N5
21	Gray fox	<i>Urocyon cinereoargenteus</i>	SGCN	N5
22	Red fox	<i>Vulpes vulpes</i>		N5
23	Bobcat	<i>Lynx rufus</i>		N5
24	River otter	<i>Lontra canadensis</i>		N5
25	Striped skunk	<i>Mephitis mephitis</i>		N5
26	Eastern spotted skunk	<i>Spilogale putorius</i>	SGCN Endangered	N4
27	Ermine	<i>Mustela erminea</i>	SGCN	N5
28	Long-tailed weasel	<i>Mustela frenata</i>	SGCN	N5
29	Least weasel	<i>Mustela nivalis</i>	SGCN	N5
30	Mink	<i>Neovison vison</i>		N5
31	Badger	<i>Taxidea taxus</i>		N5
32	Raccoon	<i>Procyon lotor</i>		N5
33	Moose	<i>Alces americanus</i>		N5
34	White-tailed deer	<i>Odocoileus virginianus</i>		N5
35	Woodchuck	<i>Marmota monax</i>		N5
36	Eastern gray squirrel	<i>Sciurus carolinensis</i>		N5
37	Eastern fox squirrel	<i>Sciurus niger</i>		N5
38	Franklin's ground squirrel	<i>Spermophilus (Poliocitellus) franklinii</i>	SGCN	N5
39	Richardson's Ground Squirrel	<i>Spermophilus (Spermophilus) richardsonii</i>		N5
40	Thirteen-lined ground squirrel	<i>Spermophilus (Ictidomys) tridecemlineatus</i>		N5
41	Eastern chipmunk	<i>Tamias striatus</i>		N5
42	Red squirrel	<i>Tamiasciurus hudsonicus</i>		N5
43	Southern Flying Squirrel	<i>Glaucomys volans</i>	SGCN	N5
44	Beaver	<i>Castor canadensis</i>		N5
45	Plains pocket gopher	<i>Geomys bursarius</i>	SGCN	N5
46	Plains pocket mouse	<i>Perognathus flavescens</i>	SGCN	N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
47	Meadow jumping mouse	<i>Zapus hudsonius</i>		N5
48	Southern Bog Lemming	<i>Synaptomys cooperi</i>	SGCN	N5
49	Prairie vole	<i>Microtus ochrogaster</i>		N5
50	Meadow vole	<i>Microtus pennsylvanicus</i>	SGCN	N5
51	Woodland vole	<i>Microtus pinetorum</i>		N5
52	Common Muskrat	<i>Ondatra zibethicus</i>		N5
53	Northern grasshopper mouse	<i>Onychomys leucogaster</i>		N5
54	White-footed mouse	<i>Peromyscus leucopus</i>		N5
55	Deermouse	<i>Peromyscus maniculatus</i>		N5
56	Western harvest mouse	<i>Reithrodontomys megalotis</i>		N5

Data Deficient Species - Species evaluated by mammal subcommittee for which insufficient information was available to conduct a conservation status assessment

	Common Name	Scientific Name	Iowa Status	National Rank	Explanation
1	Elliot's Short-tailed Shrew	<i>Blarina hylophaga</i>	SGCN	N5	IA is on northern edge of range
2	Southern Short-tailed Shrew	<i>Blarina carolinensis</i>	SGCN	N5	According to NatureServe only reaches north into southern IL - possibly in SE corner of Iowa
3	Hayden's Shrew	<i>Sorex haydeni</i>	SGCN	N4	
4	Evening Bat	<i>Nycticeius humeralis</i>	SGCN	N5	
5	Southern Bog Lemming	<i>Synaptomys cooperi</i>	SGCN Threatened	N5	

Vagrant Species - These species are considered stray or vagrant in Iowa. They have confirmed documentation of occurrence in the state but do not have established populations within Iowa. In some years, individuals of these species may expand into portions of the state.

	Common Name	Scientific Name	National Rank	Explanation
1	Nine-banded armadillo	<i>Dasypus novemcinctus</i>	N5	Occasional individuals have wandered north from MO
2	Big free-tailed bat	<i>Nyctinomops macrotis</i>	N3N4	
3	Brazilian (Mexican) free-tailed bat	<i>Tadarida brasiliensis</i>	N5	
4	Hispid cotton rat	<i>Sigmodon hispidus</i>	N5	Only found in owl pellets
5	Gray wolf	<i>Canis lupus</i>	N4	Formerly considered extirpated
6	Swift fox	<i>Vulpes velox</i>	N3	Formerly considered extirpated until recent road kill record from Lyon County
7	Black bear	<i>Ursus americanus</i>	N5	Occasional individuals have been

	Common Name	Scientific Name	National Rank	Explanation
				documented in Iowa
8	Fisher	<i>Martes pennanti</i>	N5	Historical record unclear on presence in Iowa
9	Wolverine	<i>Gulo gulo</i>	N4	Historical record unclear on presence in Iowa
10	Mountain lion	<i>Puma concolor</i>	N5	Occasional individuals have wandered into or through Iowa
11	Mule deer	<i>Odocoileus hemionus</i>	N5	
12	Moose	<i>Alces alces</i>	N5	Occasional individuals have wandered south from MN

Introduced and Domesticated Species - These species have been documented or have established breeding populations within the state of Iowa but were excluded from consideration as SGCN due to the fact that they were introduced to Iowa by humans.

	Common Name	Scientific Name	Classification
1	House mouse	<i>Mus musculus</i>	Introduced
2	Norway rat	<i>Rattus norvegicus</i>	Introduced
3	Nutria (Coypu)	<i>Myocaster coypus</i>	Introduced
4	Feral dog	<i>Canis familiaris</i>	Domesticated
5	Feral cat	<i>Felis catus</i>	Domesticated
6	Feral hog	<i>Sus scrofa</i>	Domesticated

Extirpated Species

	Common Name	Scientific Name	National Rank	Explanation
1	Pygmy shrew	<i>Microsorex hoyi</i>	N5	
2	American marten	<i>Martes americana</i>	N5	
3	Red-backed vole	<i>Clethrionomys gapperi</i>	N5	
4	Porcupine	<i>Erethizon dorsatum</i>	N5	
5	Canada lynx	<i>Lynx canadensis</i>	N4?	
6	Elk (Wapiti)	<i>Cervus elaphus</i>	N5	
7	Pronghorn	<i>Antilocapra americana</i>	N5	
8	Bison	<i>Bison bison</i>	N4	
9	Eastern woodrat	<i>Neotoma norvegicus</i>		Based on fossil evidence
10	Marsh rice rat	<i>Oryzomys palustris</i>		Based on fossil evidence

Appendix 12. List of Iowa Mussels Evaluated by the IWAP.

Taxonomic order derived from: DD Turgeon, JF Quinn Jr, AE Bogan, EV Coan, FG Hochberg, Jr, WG Lyons, PM Mikkelsen, RJ Neves, CFE Roper, G Rosenberg, B Roth, A Scheltema, FG Thompson, M Vecchione & JD Williams. 1998. *Common and scientific names of aquatic invertebrates from the United States and Canada: Mollusks. 2nd Edition.* American Fisheries Society, Special Publication 26, Bethesda, Maryland. ix + 526 pp

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	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
Order: Unionoida				
Family: Unionidae				
1	Mucket	<i>Actinonaias ligamentina</i>	SGCN	N5
2	Elktoe	<i>Alasmidonta marginata</i>	SGCN	N4
3	Slippershell	<i>Alasmidonta viridis</i>	SGCN	N4
4	Threeridge	<i>Amblema plicata</i>	SGCN	N5
5	Flat floater	<i>Anodonta suborbiculata</i>	SGCN	N5
6	Cylinder (Cylindrical papershell)	<i>Anodontoides ferussacianus</i>	SGCN Threatened	N5
7	Rock pocketbook	<i>Arcidens confragosus</i>	SGCN	N4
8	Spectacle case	<i>Cumberlandia monodonta</i>	SGCN Endangered	N3 Endangered
9	Purple wartyback	<i>Cyclonaias tuberculata</i>	SGCN Threatened	N5
10	Butterfly	<i>Ellipsaria lineolata</i>	SGCN Threatened	N4
11	Elephantear	<i>Elliptio crassidens</i>	SGCN	N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
12	Spike	<i>Elliptio dilatata</i>	SGCN	N5
13	Snuffbox	<i>Epioblasma triquetra</i>	SGCN	N3
14	Ebonyshell	<i>Fusconaia ebena</i>	SGCN	N4N5
15	Wabash pigtoe	<i>Fusconaia flava</i>	SGCN	N5
16	Plain pocketbook	<i>Lampsilis cardium</i>		N5
17	Higgins eye pearlymussel	<i>Lampsilis higginsii</i>	SGCN Endangered	N1N2 Endangered
18	Fatmucket	<i>Lampsilis siliquoidea</i>	SGCN	N5
19	Yellow sandshell	<i>Lampsilis teres</i>	SGCN Endangered	N5
20	White heelsplitter	<i>Lasmigona camplanata</i>	SGCN	N5
21	Creek heelsplitter	<i>Lasmigona compressa</i>	SGCN Threatened	N5
22	Flutedshell	<i>Lasmigona costata</i>	SGCN	N5
23	Fragile papershell	<i>Leptodea fragilis</i>		N5
24	Black sandshell	<i>Ligumia recta</i>		N4N5
25	Pondmussel	<i>Ligumia subrostrata</i>	SGCN	N5
26	Washboard	<i>Megaloniaias nervosa</i>	SGCN	N5
27	Threehorn wartyback	<i>Obliquaria reflexa</i>	SGCN	N5
28	Hickorynut	<i>Obovaria olivaria</i>	SGCN	N4
29	Bullhead (Sheepnose)	<i>Plethobasus cyphus</i>	SGCN Endangered	N3 Endangered
30	Pyramid pigtoe	<i>Pleurobema rubrum</i>	SGCN	N2N3
31	Round pigtoe	<i>Pleurobema sintoxia</i>	SGCN Endangered	N4N5
32	Pink heelsplitter	<i>Potamilus alatus</i>	SGCN	N5
33	Pink papershell	<i>Potamilus ohioensis</i>	SGCN	N5
34	Giant floater	<i>Pyganodon grandis</i>		N5
35	Monkeyface	<i>Quadrula metanevra</i>	SGCN	N4
36	Wartyback	<i>Quadrula nodulata</i>	SGCN	N4
37	Pimpleback	<i>Quadrula pustulosa</i>	SGCN	N5
38	Mapleleaf	<i>Quadrula quadrula</i>	SGCN	N5
39	Salamander mussel	<i>Simpsonaias ambigua</i>	SGCN	N1
40	Strange floater (Creeper, formerly Squawfoot)	<i>Strophitus undulatus</i>	SGCN Threatened	N5
41	Lilliput	<i>Toxolasma parvum</i>		N5
42	Pistolgrip	<i>Tritogonia verrucosa</i>	SGCN Endangered	N4
43	Fawnsfoot	<i>Truncilla donaciformis</i>	SGCN	N5
44	Deertoe	<i>Truncilla truncata</i>	SGCN	N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
45	Paper pondshell	<i>Utterbackia imbecillis</i>	SGCN	N5
46	Ellipse	<i>Venustaconcha ellipsiformis</i>	SGCN Threatened	N4

Data Deficient Species - Species evaluated by mussel subcommittee for which insufficient information was available to conduct a conservation status assessment

	Common Name	Scientific Name	Iowa Status	National Rank	Explanation
1	Pondmussel	<i>Ligumia subrostrata</i>	SGCN	N5	Historical record lacking, need to know more about current range, only a few records of this species in IA – in decline
2	Pyramid pigtoe	<i>Pleurobema rubrum</i>	SGCN	N2N3	Only shells found – possibly extirpated
3	Round pigtoe	<i>Pleurobema sintoxia</i>	SGCN Endangered	N4N5	Only rarely documented
4	Wartyback	<i>Quadrula nodulata</i>	SGCN	N4	Need more info on hosts
5	Salamander mussel	<i>Simpsonia ambigua</i>	SGCN	N1	Previously thought extirpated – two occurrences in 2008
6	Pondhorn	<i>Unio merus tetralasmus</i>	SGCN	N5	Southern Iowa range is not well surveyed

Presumed Extirpated Species

	Common Name	Scientific Name	National Rank
1	Slippershell	<i>Alasmidonta viridis</i>	N4
2	Scaleshell	<i>Leptodea leptodon</i>	N1N2
3	Fat pocketbook	<i>Potamilus capax</i>	N2
4	Winged mapleleaf	<i>Quadrula fragosa</i>	N1

Other species or groups of clams/mussels not evaluated

	Common Name	Scientific Name	Iowa Listing	National Rank	Explanation
1	Ozark pigtoe	<i>Fusconaia ozarkensis</i>	E	N3N4	Single known specimen misidentified
2	Slough sandshell	<i>Lampsilis teres teres</i>	E	N5	Formerly separate from Yellow Sandshell – now considered to be same species
3	Fingernail clams	-	-	-	Includes multiple species of

					clams
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Exotic Species - Species evaluated by mussel subcommittee for which a conservation status assessment was not conducted due to non-native status in Iowa

	Common Name	Scientific Name	National Rank
1	Asiatic clam	<i>Corbicula fluminea</i>	NNA
2	Zebra mussel	<i>Dreissena polymorpha</i>	NNA

Appendix 13. List of Iowa Terrestrial Snails Evaluated by the IWAP.

Taxonomic order and nomenclature derived from: DD Turgeon, JF Quinn Jr, AE Bogan, EV Coan, FG Hochberg, Jr, WG Lyons, PM Mikkelsen, RJ Neves, CFE Roper, G Rosenberg, B Roth, A Scheltema, FG Thompson, M Vecchione & JD Williams. 1998. *Common and scientific names of aquatic invertebrates from the United States and Canada: Mollusks. 2nd Edition.* American Fisheries Society, Special Publication 26, Bethesda, Maryland. ix + 526 pp

Iowa Status/Listing: **Iowa Status** refers to Species of Greatest Conservation Need (SGCN) status as determined through IWAP species conservation status assessments. **Iowa Listing** refers to Iowa Endangered, Threatened, or Special Concern Status (from Iowa Code Chapter 77) as of 2015. For up-to-date state listing information, please see the Threatened and Endangered Species Program page on the DNR website at www.iowadnr.gov

National Rank/Listing: **National Rank** refers to NatureServe Conservation Status Ranks. N1 = Critically Imperiled in Nation; N2 = Imperiled in Nation; N3 = Vulnerable in Nation; N4 = Apparently Secure in Nation; N5 = Secure in Nation. For additional definitions and explanation see Appendix 14. **National Listing** refers to federally Endangered or Threatened species.

Assessments of species conservation status undertaken as part of the IWAP are used to determine SGCN status only. Other information is provided as a reference. Updates to State Wildlife Action Plans, NatureServe National Ranks, Federal T&E Status, and State T&E Status are each independent processes, undertaken by different entities with differing timeframes. As such, the various listings or status ranks for a given species at a given point in time may not always appear to be in accord.

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
Helicinidae				
1	Cherrystone Drop	<i>Hendersonia occulta</i>		N4
Pomatiopsidae				
2	Slender Walker	<i>Pomatiopsis lapidaria</i>		N5
3	Brown Walker	<i>Pomatiopsis cincinnatiensis</i>		N4
Carychiidae				
4	Obese Thorn	<i>Carychium exiguum</i>		N5
5	Ice Thorn	<i>Carychium exile exile</i>		N5
Cochlicopidae				
6	Thin Pillar	<i>Cochlicopa lubricella</i>		N5
7	Glossy Pillar	<i>Cocjlicopa lubrica</i>		N5
Valloniidae				
8	Lovely Vallonia	<i>Vallonia pulchella</i>		N5
9	Costale Vallonia	<i>Vallonia costata</i>		N5
10	Trumpet Vallonia	<i>Vallonia parvula</i>		N4
11	Multirib Vallonia	<i>Vallonia gracilicosta</i>		N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
12	Thin-lip Vallonia	<i>Vallonia perspectiva</i>		N4N5
Pupillidae				
13	Widespread Column	<i>Pupilla muscorum muscorum</i>		N5
14	White-lip Dagger	<i>Pupoides albilabris</i>		N5
Vertiginidae				
15	Plains Snaggletooth	<i>Gastrocopta abbreviata</i>		N4
16	Armed Snaggletooth	<i>Gastrocopta armifera</i>		N5
17	Bottleneck Snaggletooth	<i>Gastrocopta contracta</i>		N5
18	Bark Snaggletooth	<i>Gastrocopta corticaria</i>		N5
19	Lamda Snaggletooth	<i>Gastrocopta holzingeri</i>		N5
20	Comb Snaggletooth	<i>Gastrocopta pentodon</i>		N5
21	Wing Snaggletooth	<i>Gastrocopta procera</i>		N5
22	Rio Grande Snaggletooth	<i>Gastrocopta riograndensis</i>		N1
23		<i>Gastrocopta rogersensis</i>		N3N4
24	Great Lakes Snaggletooth	<i>Gastrocopta similis</i>		N5
25	White Snaggletooth	<i>Gastrocopta tappaniana</i>		N5
26	Delicate Vertigo	<i>Vertigo bollesiana</i>		N4
27	Hubricht's Vertigo	<i>Vertigo hubrichti</i>	SGCN Threatened	N3
28	Blade Vertigo	<i>Vertigo milium</i>		N5
29	Six-whorl Vertigo	<i>Vertigo morsei</i>		N3
30	Ovate Vertigo	<i>Vertigo ovata</i>		N5
31	Crested Vertigo	<i>Vertigo pygmaea</i>		N5
32	Tapered Vertigo	<i>Vertigo elatior</i>		N5
33	Honey Vertigo	<i>Vertigo tridentata</i>		N5
34	Variable Vertigo	<i>Vertigo gouldi</i>		N5
35	Cross Vertigo	<i>Vertigo modesta modesta</i>		N5
36	Bluff Vertigo	<i>Vertigo meramecensis</i>	SGCN Endangered	N2N3
37	Mellow Column	<i>Columnella columnella alticola</i>		N5
38	High-spire Column	<i>Columnella simplex</i>		N5
39	Toothless Column	<i>Columnella edentula</i>		N5
Strobilopsidae				
40	Bronze Pinecone	<i>Strobilops aeneus</i>		N5
41	Maze Pinecone	<i>Strobilops labyrinthicus</i>		N5
Succineidae				
42	Niobrara Ambersnail	<i>Oxyloma haydeni</i>		N2N3

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
43	Blunt Ambersnail	<i>Oxyloma retusa</i>		N5
44	Humboldt Ambersnail	<i>Oxyloma sillimani</i>		N2
45	Oval Ambersnail	<i>Novisuccinean ovalis</i>		N5
46	Minnesota Pleistocene Succinea	<i>Novasuccinea n. Sp. Minnesota a</i>	SGCN Endangered	N2
47	Iowa Pleistocene Succinea	<i>Novasuccinea n. Sp. Minnesota b</i>	SGCN Endangered	N2
48	Chittenango Ambersnail	<i>Succinea chittenangoensis</i>		N1
49	Spotted Ambersnail	<i>Succinea forsheyi</i>		N4
50	Suboval Ambersnail	<i>Catinella avara</i>		N5
51	Slope Ambersnail	<i>Catinella wandae</i>		N2
Discidae				
52	Flamed Tigersnail	<i>Anguispira alternata</i>		N5
53	Angular Disc	<i>Discus catskillensis</i>		N5
54	Iowa Pleistocene Snail	<i>Discus macclintocki</i>	SGCN Endangered	N1 Endangered
55	Domed Disc	<i>Discus patulus</i>		N5
56	Striate Disc	<i>Discus shimeki</i>		N5
57	Forest Disc	<i>Discus whitneyi (=cronkhitei)</i>		N5
Heliodiscidae				
58	Compound Coil	<i>Helicodiscus parallelus</i>		N5
59	Temperate Coil	<i>Helicodiscus shimeki</i>		N4N5
Punctidae				
60	Small Spot	<i>Punctum minutissimum</i>		N5
61	Glass Spot	<i>Punctum vitreum</i>		N5
Limacidae				
62	Meadow Slug	<i>Deroceras laeve</i>		N5
63	Gray Fieldslug (Non-native)	<i>Deroceras reticulatum</i>		NNA
Philomycidae				
64	Changeable Mantleslug	<i>Megapallifera mutabilis</i>		N5
65	Pale Mantleslug	<i>Pallifera dorsalis</i>		N5
66	Redfoot Mantleslug	<i>Pallifera ohioensis</i>		N5
67	Carolina Mantleslug	<i>Philomycus carolinianus</i>		N5
Cionellidae				
68	Glossy Pillar	<i>Cochlicopa lubrica</i>		N5
69	Thin Pillar	<i>Cochlicopa lubricella</i>		N5
70	Appalachian Pillar	<i>Cochlicopa morseana</i>		N5
Helicarionidae				
71	Brown Hive	<i>Euconulus fulvus</i>		N5

	Common Name	Scientific Name	Iowa Status/Listing	National Rank/Listing
72	(classification uncertain)	<i>Guppya sterkii</i>		N5
Zonitidae				
73	Carved Glyph	<i>Glyphyalinia indentata</i>		N5
74	Minute Gem	<i>Hawaiiia miniscula</i>		N5
75	Amber Glass	<i>Nesovitrea electrina</i>		N5
76	Fine-ribbed Striate	<i>Striatura milium</i>		N5
77	Quick Gloss	<i>Zonitoides arboreus</i>		N5
78	Dull Gloss	<i>Zonitoides limatulus</i>		N4N5
79	Black Gloss	<i>Zonitoides nitidus</i>		N5
Haplotrematidae				
80	Gray-foot Lancetooth	<i>Haplotrema concavum</i>		N5
Polygyridae				
81	Broad-banded Forestsnail	<i>Allogona profunda</i>		N5
82	Upland Pillsnail	<i>Euchemotrema fraternum</i>		N5
83		<i>Euchemotrema fraternum fraternum</i>		N5
84	Lowland Pillsnail	<i>Euchemotrema leai</i>		N5
85		<i>Euchemotrema leai aliciae</i>		N5
86		<i>Euchemotrema leai leai</i>		N5
87	Yellow Globelet	<i>Mesodon clausus</i>		N5
88		<i>Mesodon clausus clausus</i>		N5
89	White-lip Globe	<i>Mesodon thyroidus</i>		N5
90	Whitelip	<i>Neohelix allolabris</i> { <i>albolabris</i> }		N5
91	Western Whitelip	<i>Neohelix alleni</i>		N5
92	Smooth Bladetooth	<i>Patera laevior</i>		N4
93	Proud Globelet	<i>Patera pennsylvanica</i>		N4
94	Bristled Slitmouth	<i>Stenotrema barbatum</i>		N5
95	Hairy Slitmouth	<i>Stenotrema hirsutum</i>		N5
96	Striped Whitelip	<i>Webbhelix multilineata</i>		N5
97	Bladetooth Wedge	<i>Xolotrema fosteri</i>		N5

Appendix 14. NatureServe National Heritage Status Rank Definitions.

Status	Definition
NX	Presumed Extirpated —Species or ecosystem is believed to be extirpated from the jurisdiction (i.e., nation, or state/province). Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered. [Equivalent to “Regionally Extinct” in IUCN Red List terminology]
NH	Possibly Extirpated – Known only from historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.
N1	Critically Imperiled —At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
N2	Imperiled —At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
N3	Vulnerable —At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
N4	Apparently Secure —At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences but with possible cause for some concern as a result of local recent declines, threats, or other factors.
N5	Secure —At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.

Variant National Conservation Ranks

Rank	Definition
N#N#	Range Rank —A numeric range rank (e.g., S2S3 or S1S3) is used to indicate any range of uncertainty about the status of the species or ecosystem. Ranges cannot skip more than two ranks (e.g., SU is used rather than S1S4).
NU	Unrankable —Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
NNR	Unranked —Nation or subnational (state/province) conservation status not yet assessed.
NNA	Not Applicable —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
Not Provided	Species is known to occur in this nation or state/province. Contact the relevant natural heritage program for assigned conservation status.

References for Appendix 14

Master, LL, D Faber-Langendoen, R Bittman, GA Hammerson, B Heidel, L Ramsay, K Snow, A Teucher, and A Tomaino. 2012. *NatureServe Conservation Status Assessments: Factors for Evaluating Species and Ecosystem Risk*. NatureServe, Arlington, VA.

Appendix 15. Iowa Animals Endangered, Threatened, and Species of Special Concern

(from Iowa Code Chapter 77 – Updated in 2011)

Due to independent timeframes for updates to Federal T&E Status, State T&E Status, and SGCN Status, the statuses for a given species at a given point in time may not always appear to be in accord.

Table Appendix 15- 1. Federally-listed Animals which are not State-listed as of 2015

Common Name	Scientific Name	T	E	C
Mammals				
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	◆		

Table Appendix 15- 2. State Endangered Animals

Federally Endangered, Threatened, and Candidate Species are indicated with a ◆ in the appropriate column for Threatened (T), Endangered (E), or Candidate (C) status. Species common and scientific names as well as species concept is presented here as presented within Iowa code. Additions to the ‘Common Name’ column (in parentheses) are added by the Plan authors for clarification.

Common Name	Scientific Name	T	E	C
Mammals				
Indiana Bat	<i>Myotis sodalis</i>		◆	
Plains Pocket Mouse	<i>Perognathus flavescens</i>			
Red-backed Vole	<i>Clethrionomys gapperi</i>			
Spotted Skunk	<i>Spilogale putorius</i>			
Birds				
Red-shouldered Hawk	<i>Buteo lineatus</i>			
Northern Harrier	<i>Circus cyaneus</i>			
Piping Plover	<i>Charadrius melodus</i>		◆	
Common Barn Owl	<i>Tyto alba</i>			
Least Tern	<i>Sterna antillarum</i>		◆	
King Rail	<i>Rallus elegans</i>			
Short-eared Owl	<i>Asio flammeus</i>			
Fish				
Lake Sturgeon	<i>Acipenser fulvescens</i>			
Pallid Sturgeon	<i>Scaphirhynchus albus</i>		◆	
Pugnose Shiner	<i>Notropis anogenus</i>			
Weed Shiner	<i>Notropis texanus</i>			
Pearl Dace	<i>Semotilus margarita</i>			
Freckled Madtom	<i>Noturus nocturnus</i>			

Common Name	Scientific Name	T	E	C
Bluntnose Darter	<i>Etheostoma chlorosomum</i>			
Least Darter	<i>Etheostoma microperca</i>			
Reptiles				
Yellow Mud Turtle	<i>Kinosternon flavescens</i>			
Wood Turtle	<i>Clemmys insculpta</i>			
Great Plains Skink	<i>Eumeces obsoletus</i>			
Copperbelly Water Snake	<i>Nerodia erythrogaster neglecta</i>	◆		
Western Hognose Snake	<i>Heterodon nasicus</i>			
Copperhead	<i>Agkistrodon contortrix</i>			
Prairie Rattlesnake	<i>Crotalus viridis</i>			
(Eastern) Massasauga Rattlesnake	<i>Sistrurus catenatus</i>			◆
Amphibians				
Blue-spotted Salamander	<i>Ambystoma laterale</i>			
Crawfish Frog	<i>Lithobates (Rana) areolata</i>			
Butterflies				
Dakota Skipper	<i>Hesperia dacotae</i>	◆		
Ringlet	<i>Coenonympha tullia</i>			
Terrestrial Snails				
Iowa Pleistocene Snail	<i>Discus macclintocki</i>		◆	
Minnesota Pleistocene Ambersnail	<i>Novisuccinea new species A</i>			
Iowa Pleistocene Ambersnail	<i>Novisuccinea new species B</i>			
Frigid Ambersnail	<i>Catinella gelida</i>			
Briarton Pleistocene Vertigo	<i>Vertigo briarensis</i>			
Bluff Vertigo	<i>Vertigo meramecensis</i>			
Iowa Pleistocene Vertigo	<i>Vertigo new species</i>			
Fresh Water Mussels				
Spectacle Case	<i>Cumberlandia monodonta</i>		◆	
Slippershell	<i>Alasmidonta viridis</i>			
Buckhorn (Pistolgrip)	<i>Tritogonia verrucosa</i>			
Ozark Pigtoe	<i>Fusconaia ozarkensis</i>			
Bullhead (Sheepnose)	<i>Plethobasus cyphyus</i>		◆	
Ohio River Pigtoe (Round Pigtoe)	<i>Pleurobema sintoxia</i>			
Slough Sandshell	<i>Lampsilis teres teres</i>			
Yellow Sandshell	<i>Lampsilis teres anodontoides</i>			
Higgin's-eye Pearly Mussel	<i>Lampsilis higginsii</i>		◆	

Table Appendix 15- 3. State Threatened Animals

Federally Endangered, Threatened, and Candidate Species are indicated with a ♦ in the appropriate column for Threatened (T), Endangered (E), or Candidate (C) status. Species common and scientific names as well as species concept is presented here as presented within Iowa code. Additions to the 'Common Name' column (in parentheses) are added by the Plan authors for clarification.

Common Name	Scientific Name	T	E	C
Mammals				
Least Shrew	<i>Cryptotis parva</i>			
Southern Bog Lemming	<i>Synaptomys cooperi</i>			
Birds				
Long-eared Owl	<i>Asio otus</i>			
Henslow's Sparrow	<i>Ammodramus henslowii</i>			
Fish				
Chestnut Lamprey	<i>Ichthyomyzon castaneus</i>			
American Brook Lamprey	<i>Lampetra appendix</i>			
Grass Pickerel	<i>Esox americanus</i>			
Blacknose Shiner	<i>Notropis heterolepis</i>			
Topeka Shiner	<i>Notropis topeka</i>		♦	
Western Sand Darter	<i>Ammocrypta clara</i>			
Black Redhorse	<i>Moxostoma duquesnei</i>			
Burbot	<i>Lota lota</i>			
Orangethroat Darter	<i>Etheostoma spectabile</i>			
Reptiles				
Slender Glass Lizard	<i>Ophisaurus attenuatus</i>			
Common Musk Turtle	<i>Sternotherus odoratus</i>			
Blanding's Turtle	<i>Emydoidea blandingii</i>			
Ornate Box Turtle	<i>Terrapene ornata</i>			
Diamondback Water Snake	<i>Nerodia rhombifer</i>			
Western Worm Snake	<i>Carphophis amoenus vermis</i>			
Speckled Kingsnake	<i>Lampropeltis getulus</i>			
Amphibians				
Mudpuppy	<i>Necturus maculosus</i>			
Central Newt	<i>Notophthalmus viridescens</i>			
Butterflies				
Poweshiek Skipperling	<i>Oarisma poweshiek</i>		♦	
Byssus Skipper	<i>Problema byssus</i>			
Mulberry Wing	<i>Poanes massasoit</i>			
Silvery Blue	<i>Glaucopsyche lygdamus</i>			
Baltimore (Checkerspot)	<i>Euphydryas phaeton</i>			
Terrestrial Snails				

Common Name	Scientific Name	T	E	C
Midwest Pleistocene (Hubricht's Vertigo)	<i>Vertigo hubrichti</i>			
Occult Vertigo	<i>Vertigo occulta</i>			
Fresh Water Mussels				
Cylinder	<i>Anodontoidea ferussacianus</i>			
Strange Floater	<i>Strophitus undulatus</i>			
Creek Heelsplitter	<i>Lasmigona compressa</i>			
Purple Pimpleback	<i>Cyclonaias tuberculata</i>			
Butterfly	<i>Ellipsaria lineolata</i>			
Ellipse	<i>Venustaconcha ellipsiformis</i>			

Table Appendix 15- 4. State Special Concern Animals

Species common and scientific names as well as species concept is presented here as presented within Iowa code. Additions to the 'Common Name' column (in parentheses) are added by the Plan authors for clarification.

Common Name	Scientific Name
Mammals	
Southern Flying Squirrel	<i>Glaucomys volans</i>
Birds	
Forster's Tern	<i>Sterna forsteri</i>
Black Tern	<i>Chlidonias niger</i>
Peregrine Falcon	<i>Falco peregrinus</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>
Fish	
Pugnose Minnow	<i>Notropis emiliae</i>
Pirate Perch	<i>Aphredoderus sayanus</i>
Reptiles	
Smooth Green Snake	<i>Opheodrys vernalis</i>
Bullsnake	<i>Pituophis catenifer sayi</i>
Butterflies	
Dreamy Duskywing	<i>Erynnis icelus</i>
Sleepy Duskywing	<i>Erynnis brizo</i>
Columbine Duskywing	<i>Erynnis lucilius</i>
Wild Indigo Duskywing	<i>Erynnis baptisiae</i>
Ottoe Skipper	<i>Hesperia ottoe</i>
Leonardus Skipper	<i>Hesperia l. leonardus</i>
Pawnee Skipper	<i>Hesperia leonardus pawnee</i>
Beardgrass (Arogos) Skipper	<i>Atrytone arogos</i>
Zabulon Skipper	<i>Poanes zabulon</i>
Broad-winged Skipper	<i>Poanes viator</i>

Common Name	Scientific Name
Sedge (Dion) Skipper	<i>Euphyes dion</i>
Two-spotted Skipper	<i>Euphyes bimacula</i>
Dusted Skipper	<i>Atrytonopsis hianna</i>
Salt-and-pepper Skipper	<i>Amblyscirtes hegon</i>
Pipevine Swallowtail	<i>Battus philenor</i>
Zebra Swallowtail	<i>Eurytides marcellus</i>
Olympia White (Olympia Marble)	<i>Euchloe olympia</i>
Purplish Copper	<i>Lycaena helloides</i>
Acadian Hairstreak	<i>Satyrium acadicum</i>
Edward's Hairstreak	<i>Satyrium edwardsii</i>
Hickory Hairstreak	<i>Satyrium caryaevorum</i>
Striped Hairstreak	<i>Satyrium liparops</i>
Swamp Metalmark	<i>Calephelis mutica</i>
Regal Fritillary	<i>Speyeria idalia</i>
(Ozark) Baltimore (Checkerspot)	<i>Euphydryas phaeton ozarkae</i>

Appendix 16. Species Status Assessment Criteria and Summarized Assessment Values

To assess the conservation status of all native, extant Iowa wildlife species, we utilized 8 criteria. The Wildlife Working Group developed a scoring process in which each criterion was weighted according to our understanding of the relative contribution of each factor to a species' overall conservation status. The theoretical potential score for an individual species ranges from 0 - 3.75. Individual species scores ranged from 0.57 (for the Slippershell Mussel, which has not been observed in Iowa since 1984) to 3.75 (for several species of low conservation concern that have been expanding their range within Iowa). The cutoff value was set at ≤ 3.0 , meaning that if a species score was a 3.0 or lower, it was categorized as Species of Greatest Conservation Need.

Status Assessment Criteria

Species with 2 or more fields that are unknown went into a separate "Data Deficient" category of species for which information requirements are high. Data Deficient Species will be categorized as SGCN. If a species has been extirpated from the state, it was also put into a separate category for further discussion; some extirpated species may be included as SGCN and others may not, depending on whether the species is a candidate for restoration activities within the state.

Range-wide Factor

Criteria 1: Range Extent – Area encompassing all known and projected occurrences, excluding vagrancy. This includes the entire range, not just the range extent within Iowa. (Breeding range only for migratory species)

Rank Value	Range in km ²	Range in square miles	Examples of Comparable Size
0	no occurrences believed to be extant; species presumed extinct	NA	NA
1	<1000 km ²	< about 400 square miles	Rocky Mountain Natl Park
2	1,000 -5000 km ²	400 - 2,000 square miles	Prince Edward Island
3	5,000 - 100,000 km ²	2,000 - 40,000 square miles	Kentucky
4	100,000 - 2,50,000 km ²	40,000 - 1,000,000 square miles	Alaska + Texas
5	>2,500,000 km ²	> 1,000,000 square miles	> Alaska + Texas

(Note - This is not intended to be an estimate of the amount of occupied or potential habitat. The use of this parameter is to determine the degree to which risks from threatening factors are spread spatially across the geographic distribution of the species.)

Iowa-Only Factors

Criteria 2: Area of Occupancy

- Extent of historical range within Iowa which currently supports the species. (Breeding and Migratory Range)
 - 0 = Species known from < 10% historic range
 - 1 = Species known from 11-25% historic range
 - 2 = Species known from 26-50% historic range
 - 3 = Species known from 51-75% historic range
 - 4 = Species known from 76-100% historic range
 - 5 = Species known from >100% historic range

Criteria 3: Long-term Trend

- Can be population numbers, density, or area occupied since time of European settlement in Iowa (Breeding and migratory range)
 - 0 = Species has declined by > 90%
 - 1 = Species has declined by 68 - 89%
 - 2 = Species has declined by 41 - 67%
 - 3 = Species has declined by 11- 40%
 - 4 = Species has declined by 0 - 10%
 - 5 = Species has increased

Criteria 4: Short-term Trend

- Can be population numbers, density or area occupied for past ten years in Iowa.
 - 0 = Species has declined by > 90%
 - 1 = Species has declined by 68 - 89%
 - 2 = Species has declined by 41 - 67%
 - 3 = Species has declined by 11- 40%
 - 4 = Species has declined by 0 - 10%
 - 5 = Species has increased

Criteria 5: Ecological Specialization (Population Concentration)

- Degree to which individuals within populations congregate or aggregate seasonally or daily in Iowa (e.g. hibernacula, breeding sites, migration focal points).
 - 0 = Majority of individuals congregate at a single location
 - 1 = Individuals concentrate at 1-25 locations
 - 2 = Individuals congregate at over 25 sites or do not concentrate

Criteria 6: Ecological Specialization (Dietary)

- Relates to the primary way in which local populations respond to decreases in availability of preferred food type.
 - 0 = Number of individuals declines, no shift in diet
 - 1 = Some shift in diet, population suffers but stabilizes
 - 2 = Species shifts to different diet, no impact to population

Criteria 7: Ecological Specialization (General)

- Species has some unique life history requirement not addressed above (e.g. hibernacula requirements; narrow ambient temperature limits; specific roosting structure)
 - 0 = Highly specialized
 - 1 = Moderately specialized
 - 2 = Not specialized

Criteria 8: Threat Not Addressed Above

- List and rank any threat not addressed above (e.g. mussels lack of recruitment; butterflies uni- or multi-voltine) If no threat, score as 4, if 0-3, articulate what threat is.
 - 0 = Severe threat to species endurance
 - 1 = High threat to species endurance
 - 2 = Medium threat to species endurance
 - 3 = Low threat to species endurance
 - 4 = no threat to species endurance

Summarized Status Assessment Values

Table 1. Mean and standard deviation for each of the 8 scoring criteria for the species that were assessed (and not categorized as data deficient).

Criteria	Mean Score	Range of Values	Standard Deviation
#1 Range Extent	4.6	0-5	0.6
#2 Area of Occupancy	3.8	0-5	1.1
#3 Long-term Trend	3.3	0-5	1.4
#4 Short-term Trend	3.8	0-5	0.9
#5 Ecological Specialization (Population concentration)	1.85	0-2	0.41
#6 Ecological Specialization (Diet)	1.75	0-2	0.46
#7 Ecological Specialization (General)	1.45	0-2	0.64
#8 Threat Not Addressed Above	3.2	0-4	1
Overall Species Status Score	2.96	0-3.75	0.55

Appendix 17. Informational Form for Nomination of New Taxonomic Groups to the Iowa Wildlife Action Plan

The Iowa Wildlife Action Plan (IWAP) currently includes all animals known to occur (or have occurred) in Iowa in the following Classes: Mammals, Birds, Amphibians, Fish, Reptiles, Odonates, Butterflies, Crayfish, and Mussels. In addition, the IWAP includes 5 species of terrestrial snails which are State threatened or endangered.

In order to include any additional taxonomic group in the Iowa Wildlife Action Plan, this set of questions needs to be returned to Karen Kinkead at Karen.Kinkead@dnr.iowa.gov. In addition, to be included, all Iowa species within the taxonomic group will need to have the Species Status Assessment Scoring Criteria completed (see Appendix 16).

Definition of taxonomic group – preferably an entire order or sub-order of species known to occur within Iowa, but we will consider groups as small as complete genera occurring within Iowa.

Please provide the following information:

1. Species list in taxonomic order to include:
 - a. Order, Family, Genus, species, Common Name
 - b. This can be placed into an excel spreadsheet.
2. Justification for why you are limiting this group to any list less than the complete Order of species occurring in Iowa.
3. How long the taxon has been studied in Iowa (i.e. are there historic data?)
 - a. Are there publications from this work? What are they?
4. What portions of the state have been surveyed for this taxon? (statewide, concentrated within one region, or concentrated within one habitat type or land use?)
5. Who are the primary people working on that taxon within Iowa?
 - a. Would they be willing to donate their time and expertise (serving on informational committees, assisting with species knowledge, etc.)?
6. What percentage of the taxonomic group is believed to be declining and why?
7. What are the threats to those species and are the threats something that can be controlled or changed?
8. How many of those species can be ranked using our ranking criteria and how many would be data deficient? (See attached criteria). This can be an estimate for the October 15 deadline.
9. Can you identify any potential grants/sources of funding (non-DNR) to study these species?
10. What exact data sources exist or are available for Iowa for these species? Do you have access to these data sources?
11. What are the accepted, standardized protocols for monitoring or documenting the species? How widespread are these protocols implemented?
12. Contact information for person sponsoring the taxon?

Appendix 18. Habitat Preferences for SGCN

Table Appendix 18- 1. Habitat preferences of SGCN – Amphibians

	Common Name	Scientific Name	Habitat Preference	Distribution
1	Blue-spotted Salamander	<i>Ambystoma laterale</i>	Forested-wooded wetlands	Cedar River Basin – Linn & Blackhawk Counties
2	Smallmouth Salamander	<i>Ambystoma texanum</i>	Woodlands, wetlands	Southern 1/3
3	Tiger Salamander	<i>Ambystoma tigrinum</i>	All aquatic habitat types, esp. lentic wetlands	Statewide
4	Common Mudpuppy	<i>Necturus maculosus</i>	Rivers, streams	Mississippi, Cedar, Wapsipinicon, Des Moines, Skunk, Raccoon, Boone, Shell Rock, Upper Iowa Rivers
5	Eastern Newt	<i>Notophthalmus viridescens</i>	Woodland wetlands	Cedar and Wapsipinicon Basins
6	Great Plains Toad	<i>Anaxyrus cognatus</i>	Grasslands & Savanna	Western border Loess Hills
7	Fowler’s Toad	<i>Anaxyrus fowleri</i>	Grasslands, Woodlands	Seven southeastern-most counties
8	Woodhouse’s Toad	<i>Anaxyrus woodhousii</i>	Woodlands & Savanna	Western border
9	Blanchard’s Cricket Frog	<i>Acris crepitans</i>	Rivers, streams, lakes, wetlands	Statewide (more common in South)
10	Cope’s Gray Treefrog	<i>Hyla chrysoscelis</i>	Wetlands, savanna grasslands, woodland edges	Scattered statewide
11	Eastern Gray Treefrog	<i>Hyla versicolor</i>	Forests, woodlands, riparian	Statewide (more common in east)
12	Crawfish Frog	<i>Lithobates areolatus</i>	Ponds, streams, grasslands	Five southeastern counties
13	Pickerel Frog	<i>Lithobates palustris</i>	Cold water streams, rivers, ponds, impoundments	Mississippi. Wapsipinicon, Maquoketa river basins
14	Northern Leopard Frog	<i>Lithobates pipiens</i>	All aquatic habitat types, wetlands	Statewide
15	Southern Leopard Frog	<i>Lithobates sphenoccephalus</i>	Wetlands, ponds, backwaters, impoundments	Seven counties along south-east border
16	Plains Spadefoot	<i>Spea bombifrons</i>	Grassland	Western border

Table Appendix 18- 2. Habitat preferences of SGCN - Reptiles

	Common Name	Scientific Name	Habitat Preference	Distribution
1	Snapping Turtle	<i>Chelydra serpentina</i>	All aquatic habitat types, wetlands	Statewide
2	Blanding's Turtle	<i>Emydoidea blandingii</i>	Shallow, well-vegetated permanent wetlands & marshes	Statewide
3	Wood Turtle	<i>Glyptemys insculpta</i>	Floodplain forest, rivers, riparian savanna	North-central (only found in Eastern IA Drift Plains ecoregion)
4	Northern Map Turtle	<i>Graptemys geographica</i>	Rivers and streams	Eastern border
5	Southern Map Turtle	<i>Graptemys ouachitensis</i>	Mississippi River and associated oxbows	Mississippi River
6	False Map Turtle	<i>Graptemys pseudogeographica</i>	Slow portions of large rivers	Mississippi and Missouri Rivers (occasionally move west from Mississippi)
7	Ornate Box Turtle	<i>Terrapene ornata</i>	Sand/loess prairie, savanna	Confirmed in 28 counties in East and southwest
8	Yellow Mud Turtle	<i>Kinosternon flavescens</i>	Shallow, ephemeral pools/herbaceous wetlands near sand soils	Southeast
9	Eastern Musk Turtle	<i>Sternotherus odoratus</i>	Herbaceous wetlands, backwaters, and spring fed ponds adjacent to sandy uplands	East
10	Smooth Softshell	<i>Apalone mutica</i>	Boundary rivers, large rivers in south	South
11	Spiny Softshell	<i>Apalone spinifera</i>	Rivers, streams, large lakes	Scattered statewide
12	Slender Glass Lizard	<i>Ophisaurus attenuatus</i>	Prairie, pastures, woodland edge, savanna	South (confirmed in 10 counties)
13	Common Five-lined Skink	<i>Plestiodon fasciatus</i>	Deciduous forests along bluffs of Mississippi & large eastern Iowa rivers	East
14	Great Plains Skink	<i>Plestiodon obsoletus</i>	Loess Hills/prairie	Three counties along southwest border

	Common Name	Scientific Name	Habitat Preference	Distribution
15	Prairie Skink	<i>Plestiodon septentrionalis</i>	Grasslands with loose soil and rocky areas adjacent to marshes or lakes	West and Central
16	Six-lined Racerunner	<i>Aspidocelis sexlineatus</i>	Sand/loess prairie, savanna	East and Southwest
17	Western Worm Snake	<i>Carphophis vermis</i>	Savanna & woodlands near rivers, creeks, or streams	Southern 1/3 (Confirmed in 8 counties)
18	(Prairie) Ringneck Snake	<i>Diadophis punctatus</i>	Woodlands, savanna, and adjacent grasslands	Scattered throughout state except in north-central
19	Western (Plains) Hog-nosed Snake	<i>Heterodon nasicus</i>	Shortgrass prairie with sandy/gravelly soils	Clinton, Muscatine, and Louisa Counties
20	Eastern Hognose Snake	<i>Heterodon platirhinos</i>	Woodland, savanna, grassland	Eastern and western borders, and south
21	Prairie Kingsnake	<i>Lampropeltis calligaster</i>	Sand prairie, grasslands, savanna & woodland edge	Southern 1/3
22	Speckled Kingsnake	<i>Lampropeltis holbrooki</i>	Grasslands near lakes or large ponds, savanna	South-eastern 1/3 (Confirmed in 12 counties)
23	*Plainbelly (Copperbelly) Water Snake	<i>Nerodia erythrogaster</i>	Mississippi River and associated backwaters and wet woodland	South-east near Mississippi River (Scott, Muscatine, Louisa counties)
24	Diamondback Water Snake	<i>Nerodia rhombifer</i>	Rivers, ponds, backwaters, oxbows	Southeast (confirmed in 4 counties)
25	Common Water Snake	<i>Nerodia sipedon</i>	Lakes, ponds, marshes, streams, backwaters	Statewide except northwest 1/4
26	Smooth Green Snake	<i>Opheodrys vernalis</i>	Wet prairie and grasslands adjacent to lakes and impoundments, savanna	Scattered throughout the state
27	Western Rat Snake	<i>Elaphe obsoleta</i>	Heavily wooded bluffs along rivers	Mississippi River and south
28	Western Fox Snake	<i>Pantherophis ramspotti</i>	Wooded rivers/streams, savanna & grasslands near lakes and marshes	Statewide
29	Gopher (Bull) Snake	<i>Pituophis catenifer</i>	Sand and bluff prairies, savanna, pasture	Statewide

	Common Name	Scientific Name	Habitat Preference	Distribution
30	Graham's Crayfish Snake	<i>Regina grahamii</i>	Ponds, sloughs, marshes, floodplains, creeks	South and central
31	(Northern) Redbelly Snake	<i>Storeria occipitomaculata</i>	Savanna, woodland and adjacent grasslands near water	North and southwest
32	Western Ribbon Snake	<i>Thamnophis proximus</i>	Herbaceous wetland, ponds, streams, rivers	Southern half
33	Plains Garter Snake	<i>Thamnophis radix</i>	Generalist	Statewide
34	Lined Snake	<i>Tropidoclonion lineatum</i>	Grassland, pasture, woodland edge	Northwest and south
35	Smooth Earth Snake	<i>Virginia valeriae</i>	Wet woodland in river valleys	Along Des Moines and Chariton Rivers in southeast and central
36	Copperhead	<i>Agkistrodon contortrix</i>	Forested, rocky hillsides	Des Moines, Lee, Van Buren and Davis counties
37	Timber Rattlesnake	<i>Crotalus horridus</i>	Forested areas with rock outcrops, esp. woodland, bluff prairie	Northeast, southeast, and Madison County
38	Prairie Rattlesnake	<i>Crotalus viridis</i>	Prairie	Plymouth County
39	Eastern Massasauga	<i>Sistrurus catenatus</i>	Prairie wetland close to rivers and adjacent upland prairie	Wapsipinicon and Iowa Rivers in east
40	Western Massasauga	<i>Sistrurus turgeminus</i>	Prairie wetland close to rivers and adjacent upland prairie	Mills County

Table Appendix 18- 3. Habitat preferences of SGCN - Breeding Birds

	Common Name	Scientific Name	Habitat Preference	Distribution
1	Trumpeter Swan	<i>Cygnus buccinator</i>	Wetland	Statewide
2	American Wigeon	<i>Anas americana</i>	Wetland	Statewide
3	Blue-winged Teal	<i>Anas discors</i>	Wetland	Statewide
4	Northern Pintail	<i>Anas acuta</i>	Wetland, grassland	Northern half
5	Canvasback	<i>Aythya valisineria</i>	Wetland	Northwest and north-central
6	Redhead	<i>Aythya americana</i>	Wetland	Northwest and north-central
7	Ring-necked Duck	<i>Aythya collaris</i>	Wetland	Statewide
8	Lesser Scaup	<i>Aythya affinis</i>	Wetland	Statewide

	Common Name	Scientific Name	Habitat Preference	Distribution
9	Northern Bobwhite	<i>Colinus virginianus</i>	Grassland, shrubland	Southern 3/4
10	Ruffed Grouse	<i>Bonasa umbellus</i>	Open woodland, dense forest	Northeast, southeast, and south-central
11	Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>	Grassland, shrubland	West
12	Greater Prairie-Chicken	<i>Tympanuchus cupido</i>	Large, landscape-scale grassland	Southwest, south-central
13	Red-necked Grebe	<i>Podiceps grisegena</i>	Wetland, hemi-marsh	Scattered statewide except southwest
14	Eared Grebe	<i>Podiceps nigricollis</i>	Wetland, hemi-marsh	Scattered statewide
15	American White Pelican	<i>Pelecanus erythrorhynchos</i>	Wetland	Statewide
16	American Bittern	<i>Botaurus lentiginosus</i>	Wetland, grassland	Northern 2/3
17	Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	Wetland, wet shrubland	Statewide, esp. in Prairie Pothole Region
18	White-faced Ibis	<i>Plegadis chihi</i>	Marsh	Prairie Pothole Region and Fremont County
19	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Forest, Rivers	Statewide
20	Northern Harrier	<i>Circus cyaneus</i>	Large grassland, marsh, prairie	Statewide
21	Red-shouldered Hawk	<i>Buteo lineatus</i>	Large riparian forest	Eastern 3/4
22	Broad-winged Hawk	<i>Buteo platypterus</i>	Deciduous forest, open woodland-large savanna	Statewide
23	Swainson's Hawk	<i>Buteo swainsoni</i>	Grassland, savanna, ag	Statewide except southeast
24	King Rail	<i>Rallus elegans</i>	Sedge meadow, wetland	East and Prairie Pothole Region
25	Common Gallinule (formerly Moorhen)	<i>Gallinula chloropus</i>	Large, wetland, hemi-marsh	Scattered statewide
26	Piping Plover	<i>Charadrius melodus</i>	Wetland, Rivers	Missouri River
27	Upland Sandpiper	<i>Bartramia longicauda</i>	Grassland, no-till soybeans	Scattered statewide
28	Wilson's Snipe	<i>Gallinago delicata</i>	Hemi-marsh	Statewide
29	American Woodcock	<i>Scolopax minor</i>	Open woodland, dense forest, riparian forest	Statewide
30	Wilson's Phalarope	<i>Phalaropus tricolor</i>	Wetland, grassland	Northern half
31	Franklin's Gull	<i>Larus pipixcan</i>	Wetland	Prairie Pothole Region
32	Least Tern	<i>Sterna antillarum</i>	Wetland, rivers with sandbars	Missouri River
33	Black Tern	<i>Chlidonias niger</i>	Wetland	Statewide

	Common Name	Scientific Name	Habitat Preference	Distribution
34	Forster's Tern	<i>Sterna forsteri</i>	Permanent wetland, hemi-marsh	Prairie Pothole Region & Missouri River floodplain
35	Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Forest, shrubland, open woodland	Statewide
36	Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Forest, shrubland, open riparian woodland	Statewide
37	Barn Owl	<i>Tyto alba</i>	Savanna, prairie-grassland with trees	Statewide, primarily southern Iowa
38	Eastern Screech-owl	<i>Otus asio</i>	Riparian forest/woodland, savanna	Statewide
39	Burrowing Owl	<i>Speotyto cunicularia</i>	Grassland	Mostly western Iowa
40	Long-eared Owl	<i>Asio otus</i>	Open woodland, savanna, coniferous & deciduous forest	Statewide
41	Short-eared Owl	<i>Asio flammeus</i>	Very large grassland	Scattered Statewide
42	Common Nighthawk	<i>Chordeiles minor</i>	Grassland, savanna, bluffland with flat rock outcrops, nests primarily on flat pea-gravel roof-tops in larger towns and cities with rivers	Statewide
43	Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	Open woodland, savanna	Mostly southern Iowa
44	Eastern Whip-poor-will	<i>Caprimulgus vociferus</i>	Deciduous forest, open woodland with grass component	Statewide
45	Chimney Swift	<i>Chaetura pelagica</i>	Older growth forests, woodlands, savanna, towns	Statewide
46	Belted Kingfisher	<i>Ceryle alcyon</i>	Wetland, riparian with cutbanks	Statewide
47	Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Savanna, open woodland, decid forest	Statewide
48	Northern Flicker	<i>Colaptes auratus</i>	Savanna, open woodland	Statewide
49	American Kestrel	<i>Falco sparverius</i>	Savanna, open woodland	Statewide
50	Peregrine Falcon	<i>Falco peregrinus</i>	Bluffland riparian forest, deciduous forest	Scattered statewide

	Common Name	Scientific Name	Habitat Preference	Distribution
51	Eastern Wood-pewee	<i>Contopus virens</i>	Forest/woodland, savanna	Statewide
52	Acadian Flycatcher	<i>Empidonax virescens</i>	Deciduous, riparian forest	Scattered statewide except northwest corner
53	Say's Phoebe	<i>Sayornis saya</i>	Grassland	Nested in Sioux and Plymouth counties
54	Eastern Kingbird	<i>Tyrannus tyrannus</i>	Grassland-shrub, edges	Statewide
55	Loggerhead Shrike	<i>Lanius ludovicianus</i>	Grassland-shrub, savannas	Scattered statewide
56	Bell's Vireo	<i>Vireo bellii</i>	Grassland-shrub, savanna	Scattered statewide
57	Horned Lark	<i>Eremophila alpestris</i>	Sparse grassland, agricultural land	Statewide
58	Purple Martin	<i>Progne subis</i>	Riparian forest, towns and wetlands	Statewide
59	Bank Swallow	<i>Riparia riparia</i>	Rivers and streams with cutbanks	Statewide
60	Sedge Wren	<i>Cistothorus platensis</i>	Marsh, dense grasslands	Statewide
61	Bewick's Wren	<i>Thryomanes bewickii</i>	Savanna, open woodland, shrubland	Southern Iowa, esp. Southeast
62	Veery	<i>Catharus fuscescens</i>	Shrubby riparian forest	Scattered statewide (less common in southwest)
63	Wood Thrush	<i>Hylocichla mustelina</i>	Shrubby forest and woodland	Scattered statewide
64	Brown Thrasher	<i>Toxostoma rufum</i>	Shrubby grassland	Statewide
65	Worm-eating Warbler	<i>Helmitheros vermivorus</i>	Shrubby deciduous forest	Mostly southeast and northeast
66	Golden-winged Warbler	<i>Vermivora chrysoptera</i>	Shrubby open woodland	Less common in western half during migration. Lee County – only nest
67	Prothonotary Warbler	<i>Protonotaria citrea</i>	Riparian forest, wooded sloughs	Scattered statewide (Eastern primarily)
68	Kentucky Warbler	<i>Geothlypis formosus</i>	Deciduous and riparian shrubby forest	Nests especially in south & northeast (rare in extreme northwest)
69	Common Yellowthroat	<i>Geothlypis trichas</i>	Shrubland and grassland	Statewide
70	Cerulean Warbler	<i>Setophaga cerulea</i>	Large older-growth deciduous forest	Primarily in eastern IA and along Des Moines River in central IA

	Common Name	Scientific Name	Habitat Preference	Distribution
71	Field Sparrow	<i>Spizella pusilla</i>	Shrubland-grassland, grass-shrub-woodland edge	Statewide
72	Grasshopper Sparrow	<i>Ammodramus savannarum</i>	Short grassland	Statewide
73	Henslow's Sparrow	<i>Ammodramus henslowii</i>	Large, older grasslands	Eastern 3/4 (most abundant in south)
74	Dickcissel	<i>Spiza americana</i>	Shrubby grassland	Statewide
75	Bobolink	<i>Dolichonyx oryzivorus</i>	Medium height grassland	Statewide
76	Eastern Meadowlark	<i>Sturnella magna</i>	Grassland, savanna	Statewide (most abundant in east)
77	Western Meadowlark	<i>Sturnella neglecta</i>	Grassland	Statewide (most abundant in west)
78	Baltimore Oriole	<i>Icterus galbula</i>	Open woodland, savanna	Statewide

Table Appendix 18- 4. Habitat preferences of SGCN – Non-Breeding Birds

	Common Name	Scientific Name	Habitat Preference	Distribution
1	Greater Scaup	<i>Aythya marila</i>	Lakes, rivers, wetlands	Scattered statewide
2	Common Loon	<i>Gavia immer</i>	Clear, large, open water, lakes	Scattered statewide
3	Little Blue Heron	<i>Egretta caerulea</i>	Marsh	Scattered statewide
4	Yellow Rail	<i>Coturnicops noveboracensis</i>	Wetland, grassland	Scattered statewide
5	Black Rail	<i>Laterallus jamaicensis</i>	Marsh	East-central, central, and northwest
6	Whooping Crane	<i>Grus americana</i>	Wetland, grassland	Northeast/north-central, southwest, and Polk County
7	Black-bellied plover	<i>Pluvialis squatarola</i>	Wetland	Scattered statewide
8	American Golden-Plover	<i>Pluvialis dominica</i>	Wetland	Scattered statewide
9	Lesser Yellowlegs	<i>Tringa flavipes</i>	Wetland	Statewide
10	Whimbrel	<i>Numenius phaeopus</i>	Wetland	West, central, and three counties in east
11	Long-billed Curlew	<i>Numenius americanus</i>	Grassland-wetland	Western half and Jefferson County
12	Hudsonian Godwit	<i>Limosa haemastica</i>	Wetland	Scattered statewide (less common in eastern ¼)
13	Marbled Godwit	<i>Limosa fedoa</i>	Wetland	Scattered statewide

	Common Name	Scientific Name	Habitat Preference	Distribution
14	Ruddy Turnstone	<i>Arenaria interpres</i>	Grassland - wetland	Scattered statewide (more common in north-central)
15	Red Knot	<i>Calidris canutus</i>	Wetland	Southern half and Kossuth and Dickinson Counties
16	Sanderling	<i>Calidris alba</i>	Wetland	Scattered statewide
17	Semipalmated Sandpiper	<i>Calidris pusilla</i>	Wetland	Statewide
18	White-rumped Sandpiper	<i>Calidris fuscicollis</i>	Wetland	Scattered statewide
19	Pectoral Sandpiper	<i>Calidris melanotos</i>	Wetland and grassland	Statewide
20	Stilt Sandpiper	<i>Micropalama himantopus</i>	Wetland	Scattered statewide
21	Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	Wetland and short grassland	Scattered statewide
22	Short-billed Dowitcher	<i>Limnodromus griseus</i>	Marsh	Scattered statewide
23	Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	Marsh	Scattered statewide
24	Caspian Tern	<i>Sterna caspia</i>	Wetland	Scattered statewide
25	Olive-sided Flycatcher	<i>Contopus cooperi</i>	Coniferous forests, openings and edges	Statewide
26	Sprague's pipit	<i>Anthus spragueii</i>	Grassland	Northwest, southwest, central
27	Bohemian Waxwing	<i>Bombycilla garrulus</i>	Coniferous or mixed forest	Scattered statewide
28	Smith's Longspur	<i>Calcarius pictus</i>	Grassland	Scattered statewide except northeast
29	Bay-breasted Warbler	<i>Dendroica castanea</i>	Forest/woodland	Scattered statewide
30	Canada Warbler	<i>Cardellina canadensis</i>	Deciduous shrubby woodland	Scattered statewide
31	American Tree Sparrow	<i>Spizella arborea</i>	Open woodland	Statewide
32	Le Conte's Sparrow	<i>Ammodramus leconteii</i>	Grassland, wetland edges	Scattered statewide except portions of the southwest
33	Harris's Sparrow	<i>Zonotrichia querula</i>	Pastures, hedgerows	Statewide
34	White-winged Crossbill	<i>Loxia leucoptera</i>	Coniferous forest	Scattered statewide (less common in southwest corner)

Table Appendix 18- 5. Habitat preferences of SGCN – Butterflies

	Common Name	Scientific Name	Habitat Preference	Distribution
1	Pipevine Swallowtail	<i>Battus philenor</i>	Forest, open fields, and roadsides	Southeast ¼
2	Zebra Swallowtail	<i>Eurytides marcellus</i>	Riparian woodland	Southern half

	Common Name	Scientific Name	Habitat Preference	Distribution
3	Spicebush Swallowtail	<i>Papilio troilus</i>	Woodlands	Southeast ¼, west-central, and northeast
4	Olympia Marble	<i>Euchloe olympia</i>	Open woodland, river bluffs, areas of poor soil, and grasslands	Western 1/3 and northeast
5	Harvester	<i>Feniseca tarquinius</i>	Woodland and streams	East and southwest/west-central
6	Purplish Copper	<i>Lycaena helloides</i>	Moist or disturbed areas	Scattered statewide except southwest
7	Acadian Hairstreak	<i>Satyrium acadica</i>	Riparian areas, woodlands, prairies	Scattered
8	Edward's Hairstreak	<i>Satyrium edwardsii</i>	Woodlands, clearings, and areas of poor soil	Scattered statewide except north-central
9	Hickory Hairstreak	<i>Satyrium caryaevorum</i>	Forest	Northeast ¼ and west
10	Striped Hairstreak	<i>Satyrium liparops</i>	Forest openings/edges, prairie along streams	Scattered
11	White M. Hairstreak	<i>Parrhasius m-album</i>	Woodland, savanna	Southeast ¼
12	Henry's Elfin	<i>Callophrys henrici</i>	Woodland	Southern 1/3
13	Reakirt's Blue	<i>Echinargus (Hemiargus) isola</i>	Native prairie	Scattered (more common in northwest)
14	Silvery Blue	<i>Glaucopsyche lygdamus</i>	Prairie, open fields, and woodland openings	Northern half and Lee County
15	Melissa Blue	<i>Plebejus (Lycaeides) melissa</i>	Prairies and grasslands	Northwest ¼ and Lucas County
16	Aphrodite Fritillary	<i>Speyeria aphrodite</i>	High quality prairie, wetlands, and fens	Scattered (more common in northern half)
17	Regal Fritillary	<i>Speyeria idalia</i>	Prairie and open grassland	Statewide
18	Silver-bordered Fritillary	<i>Boloria selene</i>	Fens, wet prairie, and meadows	Northeast ¼ and northwest corner
19	Gorgone Checkerspot	<i>Chlosyne gorgone</i>	Oldfield, roadsides, pastures, vacant lots, and native prairie	Scattered statewide except north-central
20	Baltimore Checkerspot	<i>Euphydryas phaeton</i>	Wetlands, fens, and bogs	Eastern half
21	'Ozark' Baltimore Checkerspot	<i>Euphydryas phaeton ozarkae</i>	Wetlands, fens, bogs, and woodlands	Lee and Henry Counties
22	Compton Tortoiseshell	<i>Nymphalis vaualbum (l-album)</i>	Large tracts of forest	Eastern half and Pocahontas County

	Common Name	Scientific Name	Habitat Preference	Distribution
23	Common Ringlet	<i>Coenonympha tullia</i>	Prairie and marsh edge, road ditches	Lyon, Osceola, Dickinson, and Palo Alto Counties
24	Eyed Brown	<i>Satyrodes eurydice</i>	Fens, wet prairies, and marshes	Northern 2/3
25	Monarch	<i>Danaus plexippus</i>	Open habitat and disturbed areas	Statewide
26	Southern Cloudywing	<i>Thorybes bathyllus</i>	Xeric prairie	Scattered statewide except far north and north-central
27	Hayhurst's Scallopwing	<i>Staphylus hayhurstii</i>	Floodplain and Loess Hills forests	Scattered within southern half
28	Dreamy Duskywing	<i>Erynnis icelus</i>	Woodland or edge	Allamakee County
29	Sleepy Duskywing	<i>Erynnis brizo</i>	Oak barrens, sand or shale soils	South half and east
30	Juvenal's Duskywing	<i>Erynnis juvenalis</i>	Oak forests	Scattered (more common in east ¼)
31	Mottled Duskywing	<i>Erynnis martialis</i>	Xeric prairie	Scattered (more common in west)
32	Columbine Duskywing	<i>Erynnis lucilius</i>	Rocky, wooded ravines	Eastern ¼
33	Poweshiek Skipperling	<i>Oarisma poweshiek</i>	High quality tallgrass prairie	Northern ¼
34	Ottoo Skipper	<i>Hesperia ottoe</i>	High quality mid- and tallgrass prairie	Loess Hills and northeast
35	Leonard's Skipper	<i>Hesperia leonardus</i>	Open grasslands	Southern Loess Hills and Jackson County
36	Dakota Skipper	<i>Hesperia dacotae</i>	Prairie	Dickinson County
37	Crossline Skipper	<i>Polites origines</i>	Xeric prairie	Scattered
38	Long Dash	<i>Polites mystic</i>	Xeric prairie in northwest, fens and wet prairies in northeast	Northern 2/3
39	Northern Broken-dash	<i>Wallengrenia egeremet</i>	Fens, xeric prairie, forest/woodland	Scattered except in north-central
40	Little Glassywing	<i>Pompeius verna</i>	Woodland edge	Scattered
41	Arogos Skipper	<i>Atrytone arogos</i>	Prairies and grasslands	Western half
42	Byssus Skipper	<i>Problema byssus</i>	Tallgrass prairie	Southern half
43	Mulberry Wing	<i>Poanes massasoit</i>	Wetlands, fens	Northwest ¼
44	Broad-winged Skipper	<i>Poanes viator</i>	Wetlands, fens	North-central
45	Dion Skipper	<i>Euphyes dion</i>	Sedge wetlands	Northern 2/3
46	Black Dash	<i>Euphyes conspicua</i>	Fens, wet prairies, marshes	Scattered statewide except in southwest

	Common Name	Scientific Name	Habitat Preference	Distribution
47	Two-spotted Skipper	<i>Euphyes bimacula</i>	Sedge meadows and marshes	Scattered
48	Dusted Skipper	<i>Atrytonopsis hianna</i>	Bluestem grasslands and oldfields	Loess Hills, Dickinson, Palo Alto, Allamakee, and Jackson
49	Pepper and Salt Skipper	<i>Amblyscirtes hegon</i>	Woodland edge and grass waterways	Allamakee County
50	Common Roadside-Skipper	<i>Amblyscirtes vialis</i>	High quality, xeric prairie	Loess Hills and southeast and northwest corner
51	Swarthy Skipper	<i>Nastra lherminier</i>		

Table Appendix 18- 6. Habitat preferences of SGCN – Crayfish

	Common Name	Scientific Name	Habitat Preference	Distribution
1	Devil Crayfish	<i>Cambarus diogenes</i>	Streams, creeks	
2	Calico Crayfish	<i>Orconectes immnis</i>	Sloughs, floodplains	
3	Golden Crayfish	<i>Orconectes luteus</i>	Rivers, streams, creeks	
4	Northern Clearwater Crayfish	<i>Orconectes propinquus</i>	Cool water streams	
5	Virile Crayfish	<i>Orconectes virilis</i>	Rivers, streams, ponds lacking predatory fish	
6	Prairie Crayfish	<i>Procambarus gracilis</i>	Grasslands	
7	White River Crayfish	<i>Procambrus acutus</i>		

Table Appendix 18- 7. Habitat preferences of SGCN – Dragonflies & Damselflies

	Common Name	Scientific Name	Habitat Preference	Distribution
1	Spotted Spreadwing	<i>Lestes congener</i>	Ponds and lakes of all sizes with emergent vegetation	Scattered localities across northern, eastern, and southern, Iowa
2	Amber-winged Spreadwing	<i>Lestes eurinus</i>	Fishless shallow ponds and wetlands	Eastern half, south-central, and Dickinson County
3	Sweetflag Spreadwing	<i>Lestes forcipatus</i>	Ponds and lakes with emergent vegetation	North-, south-, and east-central
4	Paiute Dancer	<i>Argia alberta</i>	Small streams, marshy springs	Western 1/3 and Polk County
5	Springwater Dancer	<i>Argia plana</i>	Small, shallow springs with canopy cover and clay substrate	Scattered statewide

	Common Name	Scientific Name	Habitat Preference	Distribution
6	Prairie Bluet	<i>Coenagrion angulatum</i>	Prairie lakes, ponds, sloughs, and slow streams with much vegetation	Northwest 1/4 into central
7	Taiga Bluet	<i>Coenagrion resolutum</i>	Ponds and wetlands	Northern 2/3
8	Boreal Bluet	<i>Enallagma boreale</i>	Fishless ponds, lakes, and slow flow streams	Northeast of line from Dickinson to Muscatine Counties
9	Alkali Bluet	<i>Enallagma clausum</i>	Ponds and lakes	Western side of northern border and Dallas County
10	Western Forktail	<i>Ischnura perparva</i>	Heavily vegetated ponds, lakes, and slow flow streams with mud substrate	Sac County
11	Sedge Sprite	<i>Nehalennia irene</i>	Ponds and sedge wetlands and meadows	Scattered statewide except extreme southeast corner
12	Canada Darner	<i>Aeshna canadensis</i>	Marshes, pond edges	Scattered localities across east and central
13	Variable Darner	<i>Aeshna interrupta</i>	Lakes, ponds, streams	Northwest ¼ to Butler and Polk Counties
14	Midland Clubtail	<i>Gomphus fraternus</i>	Creeks and rivers with rock and mud	Northeast 2/3 and Woodbury County
15	Sulphur-tipped Clubtail	<i>Gomphus militaris</i>	Ponds, lakes, streams, and creeks with mud substrate	Western and southern border and Muscatine County
16	Rapids Clubtail	<i>Gomphus quadricolor</i>	Rocky creeks and rivers with mud for nymphs	Fayette and Winneshiek Counties
17	Rusty Snaketail	<i>Ophiogomphus rupinsulensis</i>	Sandy, rocky creeks to rivers	Northeast ¼
18	Pale Snaketail	<i>Ophiogomphus severus</i>	Rivers and streams with fast flow and cobble substrate	Plymouth County
19	Sioux Snaketail	<i>Ophiogomphus smithi</i>	Sand bottomed streams with gravel beds	Northeast ¼
20	Westfall's Snaketail	<i>Ophiogomphus westfalli</i>	Clear forest streams with strong riffles and cobble substrate	Hamilton County

	Common Name	Scientific Name	Habitat Preference	Distribution
21	Brimstone Clubtail	<i>Stylurus intricatus</i>	Strong-flowing, open streams and rivers	Audubon, Page, and Woodbury County
22	Elusive Clubtail	<i>Stylurus notatus</i>	Creeks and rivers with sandy substrate	Scattered statewide except southwest and south-central
23	Arrow Clubtail	<i>Stylurus spiniceps</i>	Rivers with sandy substrate	Bremer and Clayton Counties
24	Stream Cruiser	<i>Didymops transversa</i>	Medium to large streams and rivers	Van Buren County
25	Royal River Cruiser	<i>Macromia taeniolata</i>	Lakes, rivers	Eastern border
26	Slender Baskettail	<i>Epitheca costalis</i>	Lakes, ponds, and backwaters	Lucas, Wayne, and Warren Counties
27	Smoky Shadowdragon	<i>Neurocordulia molesta</i>	Fast-flowing rivers and medium sized streams	Northeast, east-central, central, and Cherokee County
28	Stygian Shadowdragon	<i>Neurocordulia yamaskanensis</i>	Mississippi River	Allamakee and Clayton Counties
29	Plains Emerald	<i>Somatochlora ensigera</i>	Prairie Streams	Northwest ¼ and Winneshiek and Delaware Counties
30	Carolina Saddlebags	<i>Tamea carolina</i>	Marsh	Mahaska county

Table Appendix 18- 8. Habitat preferences of SGCN – Fish

	Common Name	Scientific Name	Distribution	Habitat Preference	Substrate	Flow
1	Chestnut lamprey	<i>Ichthyomyzon castaneus</i>	Miss., Chariton	Rivers		
2	Northern brook lamprey	<i>Ichthyomyzon fossor</i>	Northeast ¼	Stream	Muck	Moderate to fast
3	Silver lamprey	<i>Ichthyomyzon unicuspis</i>	Miss.	Rivers, impoundments, lakes		
4	American brook lamprey	<i>Lampetra appendix</i>	Northeast ¼	Small to medium rivers and streams		
5	Lake sturgeon	<i>Acipenser fulvescens</i>	Miss.	Large rivers and lakes	Sand, gravel, rock	
6	Pallid sturgeon	<i>Scaphirhynchus albus</i>	Mo.	Large, turbid rivers	Gravel, sand	Fast
7	Shovelnose sturgeon	<i>Scaphirhynchus platyrhynchus</i>	Miss., Mo.	Large, turbid rivers		

	Common Name	Scientific Name	Distribution	Habitat Preference	Substrate	Flow
8	Paddlefish	<i>Polyodon spathula</i>	Miss., Mo., DM, Cedar, Iowa, Skunk	Medium to large rivers, backwater, and impoundments		Slow
9	American eel	<i>Anguilla rostrata</i>	Miss., Mo., and larger tributaries	Rivers, large streams and lakes		
10	Skipjack herring	<i>Alosa chrysochloris</i>	Miss., Mo.	Medium to large rivers and large impoundments	Sand and gravel	
11	Largescale stoneroller	<i>Campostoma oligolepis</i>	Northeast 1/3	Medium to large clear streams	Gravel	
12	Gravel chub	<i>Erimystax x-punctatus</i>	Northern ½	Large streams and rivers	Gravel	
13	Western silvery minnow	<i>Hybognathus argyritis</i>	Mo. Drainage	Backwater	Sand, muck	
14	Mississippi silvery minnow	<i>Hybognathus nuchalis</i>	Eastern Miss. drainage	Backwater		Slow
15	Plains minnow	<i>Hybognathus placitus</i>	Mo. drainage	Stream, river	Silt	Slow
16	Pallid shiner	<i>Hybopsis amnis</i>	Upper. Miss.	Medium to large rivers	Sand, muck	
17	Redfin shiner	<i>Lythrurus umbratilis</i>	Northeast ¼	Rivers, streams, and creeks		
18	Shoal chub	<i>Macrhybopsis hyostomus</i>	Large interior rivers statewide	Rivers	Sand, cobble	Moderate to fast
19	Sturgeon chub	<i>Macrhybopsis gelida</i>	Eastern half and Mo.	Warm, turbid rivers		
20	Sicklefin chub	<i>Macrhybopsis meeki</i>	Mo.	Large, turbid rivers	Gravel, sand	
21	Pearl dace	<i>Margariscus margarita</i>	Worth County	Ponds and small lakes	Sand, gravel	
22	Golden shiner	<i>Notemigonus crysoleucas</i>				
23	Pugnose shiner	<i>Notropis anogenus</i>	West Okoboji Lake	Clear, vegetated lakes	Silt, sand, gravel	
24	River shiner	<i>Notropis blennius</i>				

	Common Name	Scientific Name	Distribution	Habitat Preference	Substrate	Flow
25	Ghost shiner	<i>Notropis buchanaui</i>	Miss.	Large creeks and small to medium rivers		Slow
26	Blacknose shiner	<i>Notropis heterolepis</i>	Northwest	Creeks, small rivers, and lakes with cool water	Sand	
27	Ozark minnow	<i>Notropis nubilus</i>	Northeast ¼	Creeks and small to medium rivers	Gravel, rock	Fast
28	Carmine shiner	<i>Notropis percobromus</i>	Northeast ¼			
29	Silverband shiner	<i>Notropis shumardi</i>				
30	Weed shiner	<i>Notropis texanus</i>	Cedar, Miss.	Creeks and small to medium rivers	Sand	
31	Topeka shiner	<i>Notropis topeka</i>	DM, Boone, Raccoon, Rock drainages	Backwaters, creeks, streams, and rivers with clear water		Slow
32	Mimic shiner	<i>Notropis volucellus</i>				
33	Channel shiner	<i>Notropis wickliffi</i>	Iowa River			
34	Pugnose minnow	<i>Opsopoeodus emiliae</i>	Miss.	Vegetated lakes, impoundments and streams		Slow
35	Suckermouth minnow	<i>Phenacobius mirabilis</i>	Upper DM basin			
36	Southern redbelly dace	<i>Phoxinus erythrogaster</i>	Northeast 1/3 and Northwest ¼			
37	Flathead chub	<i>Platygobio gracilis</i>	Mo. drainage	Turbid rivers		
38	Longnose dace	<i>Rhinichthys cataractae</i>	Northeast corner	Clear, small to medium rivers	Gravel, rock	Fast
39	Blue sucker	<i>Cycleptus elongatus</i>	Miss., Mo., and large tributaries	Large rivers		
40	Lake chubsucker	<i>Erimyzon succetta</i>				

	Common Name	Scientific Name	Distribution	Habitat Preference	Substrate	Flow
41	Black buffalo	<i>Ictiobus niger</i>	Miss. and large tributaries	Backwaters, rivers, and impoundments		
42	Spotted sucker	<i>Minytrema melanops</i>	Miss.	Small to medium rivers	Firm	Slow
43	Silver redhorse	<i>Moxostoma anisurum</i>				
44	River redhorse	<i>Moxostoma carinatum</i>	Upper pools of Miss.	Large creeks and river with clear water		
45	Black redhorse	<i>Moxostoma duquesnei</i>	Turkey, Upper Iowa, Cedar, Wapsi, drainages	Creeks and small to medium rivers	Gravel, rock	
46	Brown bullhead	<i>Ameiurus nebulosus</i>	Northern 1/3	Ponds, lakes, backwaters, impoundments, and streams		Slow
47	Blue catfish	<i>Ictalurus furcatus</i>	Lower Miss, Mo.	Rivers and backwaters		
48	Slender madtom	<i>Noturus exilis</i>	Miss. tributaries	Medium to large streams and small to medium rivers		Moderate to fast
49	Tadpole madtom	<i>Noturus gyrinus</i>	Statewide	Vegetated lakes, impoundments, backwaters, creeks, and rivers	Muck	Slow
50	Freckled madtom	<i>Noturus nocturnus</i>	Miss. drainage	Creeks and rivers		Slow to moderate
51	Redfin (Grass) pickerel	<i>Esox americanus</i>	Miss. and tributaries	Vegetated backwaters, ponds, and small lakes		Slow
52	Northern pike	<i>Esox lucius</i>				
53	Central mudminnow	<i>Umbra limi</i>	Northern 1/3	Vegetated streams and backwaters		Slow
54	Brook Trout	<i>Salvelinus fontinalis</i>	Northeast corner	Cool creeks, streams, and rivers	Sand, gravel, cobble, rock	Moderate to fast

	Common Name	Scientific Name	Distribution	Habitat Preference	Substrate	Flow
55	Trout perch	<i>Percopsis omiscomaycus</i>	Northwest ¼, Miss., Grand, Chariton	Streams and rivers	Sand	
56	Pirate perch	<i>Aphredoderus sayanus</i>	Miss. and large tributaries	Vegetated lakes, ponds, and backwaters		
57	Burbot	<i>Lota lota</i>	Mo., Miss. and Miss. tributaries	Deep, cold lakes and rivers		
58	Brook silverside	<i>Labidesthes sicculus</i>	East			
59	Banded killifish	<i>Fundulus diaphanus</i>	Natural lakes in northwest Mo.	Lakes, ponds, streams		Slow
60	Starhead topminnow	<i>Fundulus dispar</i>	Little Sioux and Iowa	Creeks and backwaters	Muck	None
61	Blackstripe topminnow	<i>Fundulus notatus</i>	Eastern 1/3	Turbid backwaters and streams		
62	Plains topminnow	<i>Fundulus sciadicus</i>	Rock River basin	Creeks, streams, and backwaters		Moderate
63	Mottled sculpin	<i>Cottus bairdii</i>	Lower Bear Creek	Clear, cool, creeks and small rivers	Sand, gravel, rock	
64	Slimy sculpin	<i>Cottus cognatus</i>	Northeast corner	Cold streams	Rock	Fast
65	Rock bass	<i>Ambloplites rupestris</i>			Rock	
66	Northern (longear) sunfish	<i>Lepomis peltastes</i>				
67	Western sand darter	<i>Ammocrypta clara</i>	Miss.	Medium to large rivers	Sand	Slow to moderate
68	Crystal darter	<i>Crystallaria asprella</i>	Miss., Turkey	Small to medium rivers	Sand, gravel	
69	Mud darter	<i>Etheostoma asprigene</i>	Miss. and tributaries	Backwaters and rivers	Sand, muck	Slow
70	Rainbow darter	<i>Etheostoma caeruleum</i>	Cedar River basin			
71	Bluntnose darter	<i>Etheostoma chlorosomum</i>	Miss.	Small to medium rivers, creeks, and backwaters	Sand, muck	Slow

	Common Name	Scientific Name	Distribution	Habitat Preference	Substrate	Flow
72	Iowa darter	<i>Etheostoma exile</i>	Northern ½	Cool creeks, ponds, and lakes	Muck, sand	None or slow
73	Least darter	<i>Etheostoma microperca</i>	Maquoketa, tributaries to Otter Creek	Vegetated creeks		Slow
74	Orangethroat darter	<i>Etheostoma spectabile</i>	Southeast ¼	Creeks and small rivers	Sand, cobble, gravel, bedrock	Moderate to fast
75	Banded darter	<i>Etheostoma zonale</i>	Northeast ¼	Rivers and large creeks	Cobble, gravel	Moderate
76	Logperch	<i>Percina caprodes</i>	Miss. drainage, Clear Lake	Creeks, streams, rivers, lakes, and impoundments	Sand, gravel	Moderate to fast
77	Blackside darter	<i>Percina maculata</i>	Northern 2/3	Creeks, and small to medium rivers	Sand, gravel	Slow
78	Slenderhead darter	<i>Percina phoxocephala</i>	Miss. drainage	Creeks and small to medium rivers	Cobble, gravel, and bedrock	Moderate to fast
79	River darter	<i>Percina shumardi</i>	Miss.	Large rivers	Gravel, rock	Fast

Table Appendix 18- 9. Habitat preferences of SGCN – Mammals

	Common Name	Scientific Name	Habitat Preference	Distribution
1	Hayden's Shrew	<i>Sorex haydeni</i>	Grasslands, wetlands, riparian	West
2	Elliot's Short-tailed Shrew	<i>Blarina hylophaga</i>	Forest, woodland, savanna, grassland	Extreme southwest
3	Southern Short-tailed Shrew	<i>Blarina carolinensis</i>	Forests, shrublands, grasslands, wetlands	Southeast corner (?)
4	Least Shrew	<i>Cryptotis parva</i>	Woodland, savanna, grassland, riparian	Southern and eastern
5	Northern (Myotis) Long-eared Bat	<i>Myotis septentrionalis</i>	Forest, woodlands	Statewide
6	Little Brown Bat	<i>Myotis lucifugus</i>	Woodland near waterways; readily rears young in buildings & bat houses	Statewide
7	Indiana Bat	<i>Myotis sodalis</i>	Forest, upland and riparian	Southeast two-thirds

	Common Name	Scientific Name	Habitat Preference	Distribution
8	Silver-haired Bat	<i>Lasionycteris noctivagans</i>	Woodland edge, riparian	Statewide
9	Eastern Pipistrelle	<i>Perimyotis subflavus</i>	Woodland edge, riparian	East
10	Evening Bat	<i>Nycticeius humeralis</i>	Forest, riparian	Southern half
11	White-tailed Jackrabbit	<i>Lepus townsendii</i>	Short grasslands, hayfields, esp. cultivated areas	Historically nearly statewide, now in Central/north-central
12	Franklin's Ground Squirrel	<i>Spermophilus franklinii</i>	Tallgrass prairie, savanna and roadsides	Statewide (all recent documentation in southern IA)
13	Southern Flying Squirrel	<i>Glaucomys volans</i>	Oak-hickory forest	Eastern 2/3 of state, especially along Mississippi and Des Moines rivers
14	Plains Pocket Gopher	<i>Geomys bursarius</i>	Open grassy areas with well-drained soil	State-wide
15	Plains Pocket Mouse	<i>Perognathus flavescens</i>	Prairie, sand and loess	West (Loess Hills), disjunct in east
16	Southern Bog Lemming	<i>Synaptomys cooperi</i>	Moist grassland, sedge meadow, bog, woodland, shrubland	Probably statewide, primarily southern Iowa
17	Woodland Vole	<i>Microtus pinetorum</i>	Deciduous riparian forests with ground layer of leaf litter	Southern and eastern
18	Gray Fox	<i>Urocyon cinereoargenteus</i>	Mixed forests and open woodlands/savanna	Statewide, primarily in southern 1/3
19	Long-tailed Weasel	<i>Mustela frenata</i>	Generalist; found in all habitats near water	Statewide – sparse distribution
20	Least Weasel	<i>Mustela nivalis</i>	Meadows, fields, shrubby areas, and open woodlands	Statewide – most common in northeast
21	Spotted Skunk	<i>Spilogale putorius</i>	Oak savanna, grassland, open woodland, and farmsteads	Statewide historically (most recent documentation in Webster, Ringgold, Pole and Marion counties)
22	Ermine	<i>Mustela ermine</i>	Shrubby or woodland areas, usually near water	Northern half of state

Table Appendix 18- 10. Habitat preferences of SGCN – Mussels

	Common Name	Scientific Name	Distribution	Habitat Preference	Substrate	Flow
1	Mucket	<i>Actinonaias ligamentina</i>	Cedar River	Medium to large rivers	Firm gravel	
2	Elktoe	<i>Alasmidonta marginata</i>	Northeast ¾	Medium streams	Sand, gravel	Moderate
3	Slippershell	<i>Alasmidonta viridis</i>	East	Creeks, streams	Sand, muck	
4	Three Ridge	<i>Amblema plicata</i>	Miss. and Iowa Rivers	Small to large rivers and lakes	Gravel, sand, mud	
5	Flat Floater	<i>Anodonta suborbiculata</i>	Miss. River	Ponds, lakes, rivers	Muck, silt	None or slow
6	Cylinder (Cylindrical Papershell)	<i>Anodontoides ferussacianus</i>	North-central	Small creeks	Sand, muck	
7	Rock Pocketbook	<i>Arcidens confragosus</i>	Miss. River	Medium to large rivers	Sand, muck	
8	Spectacle Case	<i>Cumberlandia monodonta</i>	Miss. River	Large rivers	Sand, muck	Fast
9	Purple Wartyback	<i>Cyclonaias tuberculata</i>	Southeast	Medium to large rivers	Gravel	
10	Butterfly	<i>Ellipsaria lineolata</i>	Miss. and Cedar Rivers	Large rivers	Sand, gravel	
11	Elephant Ear	<i>Elliptio crassidens</i>	Upper Cedar and Miss. Rivers	Large rivers	Mud, sand, gravel	
12	Spike	<i>Elliptio dilatata</i>	Northeast ¾	Streams and lakes	Firm, sand, gravel	
13	Snuffbox	<i>Epioblasma triquetra</i>		Medium to large rivers	Gravel	
14	Ebonyshell	<i>Fusconaia ebena</i>	Miss. River	Large, deep rivers	Sand, gravel	
15	Wabash pigtoe	<i>Fusconaia flava</i>	Scattered statewide	Creeks to large rivers	Gravel, sand	
16	Higgins' Eye Pearlymussel	<i>Lampsilis higginsii</i>	Miss. River	Large rivers	Gravel, sand	
17	Fatmucket	<i>Lampsilis siliquoidea</i>	Miss. and Shell Rock Rivers	Small streams to large rivers, lakes, reservoirs		
18	Yellow Sandshell	<i>Lampsilis teres anodontoides</i>	Northeast 2/3	Medium to large rivers	Sand, gravel	
19	White Heelsplitter	<i>Lasmigona camplanata</i>		Medium to large rivers	Mud, mud-gravel	
20	Creek Heelsplitter	<i>Lasmigona compressa</i>	Northeast 2/3	Creeks, streams	Sand, gravel	

	Common Name	Scientific Name	Distribution	Habitat Preference	Substrate	Flow
21	Fluted Shell	<i>Lasmigona costata</i>	Northeast ¾	Medium to large rivers	Sand, gravel, muck	
22	Pondmussel	<i>Ligumia subrostrata</i>	DM and Iowa Rivers	Small creeks and ponds	Sand, muck	
23	Black Sandshell	<i>Ligumia recta</i>		Medium to large rivers	Gravel, firm sand	
24	Washboard	<i>Megaloniais nervosa</i>	Miss. River	Large rivers	Gravel, gravel-mud	Fast
25	Threehorn Wartyback	<i>Obliquaria reflexa</i>	Skunk, Iowa, DM River	Medium to large rivers	Gravel	
26	Hickorynut	<i>Obovaria olivaria</i>	Miss. River	Large rivers	Sand, gravel	
27	Bullhead (Sheepnose)	<i>Plethobasus cyphus</i>	Miss. and DM Rivers	Medium to large rivers	Sand, gravel	
28	Pyramid pigtoe	<i>Pleurobema rubrum</i>	Miss. River	Large rivers	Gravel-sand	
29	Round pigtoe	<i>Pleurobema sintoxia</i>	Northeast ¾	Streams and rivers	Firm, sand, gravel	
30	Pink Heelsplitter	<i>Potamilus alatus</i>		Medium to large rivers		
31	Pink Papershell	<i>Potamilus ohioensis</i>		Medium to large rivers		
32	Monkeyface	<i>Quadrula metanevra</i>	Eastern 2/3	Medium to large rivers	Gravel	
33	Wartyback	<i>Quadrula nodulata</i>	Miss. River	Large rivers	Sand, gravel	
34	Pimpleback	<i>Quadrula pustulosa</i>		Small streams to large rivers		
35	Mapleleaf	<i>Quadrula quadrula</i>		Medium to large rivers	Gravel, sand	
36	Salamander mussel	<i>Simpsonaias ambigua</i>	Miss. River	Rivers	Mud	
37	Strange Floater (Creeper, Formerly Squawfoot)	<i>Strophitus undulatus</i>	Northeast ¾	Small to medium streams	Sand, gravel, muck	
38	Pistolgrip	<i>Tritogonia verrucosa</i>	Miss., Iowa, and DM Rivers	Medium to large rivers	Sand, gravel, muck	
39	Fawnsfoot	<i>Truncilla donaciformis</i>	East	Medium to large rivers	Sand, gravel	

	Common Name	Scientific Name	Distribution	Habitat Preference	Substrate	Flow
40	Deertoe	<i>Truncilla truncata</i>		Medium streams to large rivers	Mud, gravel, sand	
41	Pondhorn	<i>Uniomorus tetralasmus</i>	South-central	Ponds, creeks, streams, rivers	Muck, sand	
42	Paper Pondshell	<i>Utterbackia imbecillis</i>	Northeast $\frac{3}{4}$	Ponds, lakes, impoundments, rivers	Muck	Slow
43	Ellipse	<i>Venustaconcha ellipsiformis</i>	Eastern $\frac{2}{3}$	Small to medium streams	Sand, gravel	

Table Appendix 18- 11. Habitat preferences of SGCN – Terrestrial Snails

	Common Name	Scientific Name	Habitat	Distribution
1	Iowa Pleistocene Snail	<i>Discus macclintocki</i>	Forest	NE
2	Minnesota Pleistocene Succinea	<i>Novasuccinea n. Sp. Minnesota a</i>	Forest	NE
3	Iowa Pleistocene Succinea	<i>Novasuccinea n. Sp. Minnesota b</i>	Forest	NE
4	Hubricht's Vertigo	<i>Vertigo hubrichti</i>	Forest	NE
5	Bluff Vertigo	<i>Vertigo meramecensis</i>	Forest	NE

Appendix 19. SGCN grouped by major cover types/habitat classes

Table Appendix 19- 1. Habitat Preferences of SGCN - Forest Habitat

Forest-Associated SGCN		
Group	Common Name	Comments
Amphibians		
1	Blue-spotted Salamander	Shallow, fish-free, woodland ponds for breeding
2	Smallmouth Salamander	Woodland pools
3	Tiger Salamander	All aquatic habitat types, esp. permanent wetlands like lakes, ponds, and prairie marshes
4	Eastern Newt	Well vegetated woodland pools
5	Fowler's Toad	Woodlands, open areas near woodland edge, oak savanna
6	Woodhouse's Toad	Loess Hills woodlands & oak savanna
7	Eastern Gray Treefrog	Forests and woodlands, especially along river valleys
Reptiles		
1	Wood Turtle	Floodplain forests, rivers, riparian oak savanna
2	Common Five-lined Skink	Goat prairies, savannas, & rocky blufflands in forests along Mississippi River
3	Western Worm Snake	Forests and woodlands and oak savanna near rivers and streams
4	(Prairie) Ringneck Snake	Deciduous woodlands, oak savannas, and adjacent prairies
5	Eastern Hognose Snake	Oak savannas, woodlands, grasslands, bluff prairies
6	Plainbelly (Copperbelly) Water Snake	Mississippi River and associated backwaters and wet woodland
7	Western Rat Snake	Forested riparian areas, arboreal
8	Smooth Earth Snake	Moist woodland and savanna, riparian areas
9	Timber Rattlesnake	Deciduous forest, savanna, and goat prairies with limestone outcrops
10	Copperhead	Rocky forested hillsides and valleys adjacent to Mississippi and Des Moines rivers (SE corner of state).
Birds		
1	Ruffed Grouse	Prefers large forests or woodlands containing areas of high stem density
2	Bald Eagle	Prefers riparian forest
3	Red-shouldered Hawk	Prefers riparian forest with sloughs
4	Broad-winged Hawk	Large contiguous forests, woodlands and oak savannas
5	American Woodcock	Prefers moist brushy woodlands w/openings
6	Yellow-billed Cuckoo	Prefers forest-woodland-savanna thickets w/4' to 8' shrubs
7	Black-billed Cuckoo	Prefers woodland thickets w/2' to 6' shrubs, especially riparian
8	Eastern Screech-owl	Riparian forests, woodlands, savannas

Forest-Associated SGCN		
Group	Common Name	Comments
9	Long-eared Owl	Open woodlands, savannas, edges, especially in conifer plantations
10	Chuck-will's-widow	Oak hickory woodlands, mixed deciduous woodlands
11	Whip-poor-will	Prefers un-grazed forest w/open understory
12	Red-headed Woodpecker	Oak savanna and mature open woodlands with snags
13	Northern Flicker	Oak savanna and mature open woodlands with snags
14	American Kestrel	Oak savanna and wooded farmsteads with large trees
15	Peregrine Falcon	Nests in rocky cliffs along major rivers
16	Eastern Wood-pewee	Oak forest & woodlands, oak savanna
17	Olive-sided Flycatcher (NB)	Feeds along forest openings and edges
18	Acadian Flycatcher	Prefers riparian areas of large, mature, un-fragmented forests
19	Veery	Prefers moist forests w/low tree & shrub understory
20	Wood Thrush	Prefers large mature, moist forest w/closed canopy & shrubby component
21	Bohemian Waxwing (NB)	Coniferous or mixed forest
22	Worm-eating Warbler	Prefers large, un-fragmented forests w/shrub understory
23	Golden-winged Warbler	Prefers forest and woodland openings with shrubs and grass
24	Bay-breasted Warbler (NB)	Forests and woodlands, nests in conifers
25	Canada Warbler (NB)	Prefers mature forest w/shrubby undergrowth
26	Prothonotary Warbler	Prefers swampy, mature riparian forest
27	Kentucky Warbler	Prefers large riparian forest, especially ravine areas with shrubby forest understory
28	Cerulean Warbler	Prefers large, mature, un-fragmented oak forest
29	White-winged Crossbill (NB)	Dependent upon coniferous forest
Butterflies		
1	Pipevine Swallowtail	Old growth woodlands, SE corner of Iowa
2	Zebra Swallowtail	Mesic lowland forests. PawPaw is larval host
3	Spicebush Swallowtail	Preferred larval hostplant Spicebush, also prickly ash and sassafras
4	Harvester	Woodlands. Associated with wooly aphid colonies, which feed on alder.
5	Hickory Hairstreak	Oak hickory woodlands. Shagbark hickory is larval hostplant.
6	White M Hairstreak	Deciduous open woodlands, savannas. Oak is larval hostplant
7	Ozark Baltimore Checkerspot	Open, dry woodlands in far southeast Iowa
8	Compton Tortoiseshell	Large areas of mature forest in far Northeastern Iowa
9	Hayhurst's Scallopwing	Wooded groves, Loess Hills woodland, floodplain forest
10	Juvenal's Duskywing	Oak woodlands, oaks are larval hostplant
11	Columbine Duskywing	Rocky wooded ravines
Mammals		
1	Elliot's Short-tailed Shrew	Forests, woodlands, savannas, grasslands
2	Southern Short-tailed Shrew	Forests, shrublands, grasslands, wetlands

Forest-Associated SGCN		
Group	Common Name	Comments
3	Northern Long-eared Bat	Forests and woodlands, forage in forest understory, roost in live or dead trees and in wooden buildings and structures in summer
4	Indiana Bat	Forage along forested riparian areas. Summer roosts in trees behind loose peeling bark.
5	Silver-haired Bat	Forage in woodland clearings and edges or along riparian areas. Roost in live or dead trees. Often winter in occupied houses in woodlands.
6	Eastern Pipistrelle	Forage along riparian areas and forest edges. Summer roosts in live trees or structures.
7	Evening Bat	Forage along forested riparian areas and forest edges. Summer roosts in trees or structures.
8	Southern Flying Squirrel	Mature oak-hickory forests, woodlands with snags
9	Woodland Vole	Deciduous forest with leaf litter
10	Gray Fox	Moderate to mature, diverse mixed forest
11	Spotted Skunk	Oak savanna, open woodland-grassland
12	Ermine	Prefers meadows bordering forests, marshes and riparian woodlands
Terrestrial Snails		
1	Iowa Pleistocene Snail	Algific slopes
2	Minnesota Pleistocene Succinea	Moderate cliffs
3	Iowa Pleistocene Succinea	Moderate cliffs
4	Hubricht's Vertigo	Algific slopes
5	Bluff Vertigo	Limestone and dolomite cliffs and outcrops

SGCN Associated with Specific Forest Habitats

Table Appendix 19- 1- A. Cliff and Algific Talus Slopes

Moderate Cliffs and Algific Talus Slopes-Associated SGCN		
Group	Common Name	Comments
Terrestrial Snails		
1	Iowa Pleistocene Snail	Algific slopes
2	Minnesota Pleistocene Succinea	Moderate cliffs
3	Iowa Pleistocene Succinea	Moderate cliffs
4	Hubricht's Vertigo	Algific slopes
5	Bluff Vertigo	Limestone and dolomite cliffs and outcrops

Table Appendix 19- 1- B. Open Woodland and Savannah – areas of relatively less dense canopy cover
(canopy cover ranging from ~25% in savanna, up to ~60% for open woodland)

Open Woodlands and Savannas-Associated SGCN		
Group	Common Name	Comments
Amphibians		
1	Cope's Gray Treefrog	Near wetlands in oak savannas, woodland edges, and grasslands
Reptiles		
1	Ornate Box Turtle	Savannas with sandy soil, sand prairies
2	Slender Glass Lizard	Savannas with sandy or loose soil
3	Common Five-lined Skink	Rocky woodland openings, bluff prairies within woodlands
4	Six-lined Racerunner	Sand prairie, bluff prairie, Loess Hills prairie, savanna
5	(Prairie) Ringneck Snake	Bluff prairies and adjacent deciduous woodlands, grassland/woodland edges
6	Eastern Hognose Snake	Oak savannas, woodlands, grasslands, bluff prairies
7	Prairie Kingsnake	Oak savannas, sand prairies, woodland edges
8	Speckled Kingsnake	Oak savannas, grasslands, and woodland edges
9	Smooth Green Snake	Oak savannas, grasslands
10	Gopher (Bull) Snake	Oak savannas, sand prairie, bluff prairie
11	Graham's Crayfish Snake	Wetlands or creeks within woodlands, sandy soils with abundant crayfish.
12	(Northern) Redbelly Snake	Grassland/woodland edges, dry sandy areas, near water sources
13	Timber Rattlesnake	Steep bluffs, goat prairie, oak savannas, oak-hickory woodlands
Birds		
1	Swainson's Hawk	Prefers savanna over woodland
2	Ruffed Grouse	Prefers large forests or woodlands containing areas of high stem density
3	American Woodcock	Moist brushy woodlands
4	Black-billed Cuckoo	Woodland thickets w/2'-6' shrubs, especially riparian
5	Yellow-billed Cuckoo	Prefers woodland thickets w/4' to 8' shrubs
6	Barn Owl	Prefers savanna over woodland
7	Long-eared Owl	Prefers areas of woodland-grassland interface, especially prefers large conifer stands
8	Chuck-will's-widow	Oak hickory woodlands, mixed deciduous woodlands
9	Eastern Whip-poor-will	Open woodlands, forests with open understory
10	Red-headed Woodpecker	Oak savannas preferred
11	Northern Flicker	Oak savannas, open woodlands, grassland/woodland edges
12	Eastern Kingbird	Grassland/woodland edges
13	Loggerhead Shrike	Thorny shrubs/trees in savanna/grasslands
14	Bell's Vireo	Thickets in savanna/grasslands
15	Bewick's Wren	Oak savannas, open woodlands with strong shrub component
16	Golden-winged Warbler	Prefers woodland openings with shrubby understory vegetation

Open Woodlands and Savannas-Associated SGCN		
Group	Common Name	Comments
17	Eastern Meadowlark	Prefers savanna over open grasslands
18	Baltimore Oriole	Oak savannas, open woodlands, woodland edges, parks
Butterflies		
1	Zebra Swallowtail	Riparian areas
2	Harvester	Woodlands, associated with woolly aphid colonies, which feed on alders
3	Edward's Hairstreak	Savannas, forest edge or clearings
4	Hickory Hairstreak	Oak-hickory woodlands. Shagbark hickory is larval hostplant.
5	Striped Hairstreak	Margins of woodlands - openings and edges of bedrock glades
6	White M Hairstreak	Oak savannas and woodlands, oaks are larval hostplants
7	Henry's Elfin	Open woodlands with redbud trees
8	Silvery Blue	Open, dry woodlands, and prairies
9	Ozark Baltimore Checkerspot	Open, dry woodlands in far southeast Iowa
10	Southern Cloudywing	Limestone and sandstone glades, sand prairies, Loess Hills prairies
11	Hayhurst's Scallopwing	Wooded groves near sand prairie
12	Dreamy Duskywing	Savanna, scrubland, far Northeast Iowa only
13	Sleepy Duskywing	Oak savanna or woodlands adjacent to dry prairie
14	Juvenal's Duskywing	Oak woodlands, oaks are larval hostplant
15	Columbine Duskywing	Limestone and sandstone glades
16	Northern Broken-dash	Grasslands near woodland edges, generalist
17	Pepper and Salt Skipper	Woodland edges, forest openings
Mammals		
1	Elliot's Short-tailed Shrew	Forests, woodlands, savannas and grasslands
2	Northern Long-eared Bat	Forests and woodlands, forage in forest understory, roost in live or dead trees in summer
3	Franklin's Ground Squirrel	Savannas and prairies
4	Spotted Skunk	Primarily a savanna species; also grasslands and woodlands

Table Appendix 19- 1- C. Woodland Pools

Woodland Pools-Associated SGCN		
Group	Common Name	Comments
Amphibians		
1	Central Newt	Vicinity of woodland pools
2	Tiger Salamander	All aquatic habitat types, esp. lentic wetlands
3	Blue-spotted Salamander	Vicinity of woodland pools, adjacent to Cedar River
4	Smallmouth Salamander	Vicinity of woodland pools, especially in floodplains

Table Appendix 19- 2. Habitat Preferences of SGCN - Shrubland Habitat Class

Shrubland-Associated SGCN		
Group	Common Name	Comments
Amphibians		
1	Tiger Salamander	All aquatic habitat types, esp. permanent wetlands like lakes, ponds, and prairie marshes
Reptiles		
1	Northern Prairie Skink	Open shrubland with a strong grass component
2	Smooth Green Snake	Open shrubland with a strong grass component
3	Eastern Massasauga Rattlesnake	Especially willow thickets in spring and fall
Birds		
1	Black-crowned Night Heron	Wetlands ringed with shrubs
2	Northern Bobwhite	Combination of grassland, shrubs, open woods
3	Sharp-tailed Grouse (Ex)	Prefers shrubby grassland
4	Yellow-billed Cuckoo	Woodland thickets, 4' to 8' shrubs
5	Black-billed Cuckoo	Woodland thickets w/ 2' to 6' shrubs, esp. riparian
6	Eastern Kingbird	Shrubby grassland and savanna edges
7	Loggerhead Shrike	Thorny shrublands of open country and savanna
8	Bell's Vireo	Prefers brushy, tangled habitat along grasslands and savannas, especially in dogwoods
9	Bewick's Wren	Prefers shrubby oak savanna or open woodlands
10	Brown Thrasher	Prefers shrubby grasslands or savannas
11	Golden-winged Warbler	Prefers shrubby open woodlands and savanna
12	Field Sparrow	Favors shrubby successional habitat, old fields
13	American Tree Sparrow (NB)	In winter - hedgerows, shrubby fields, yards
14	Harris's Sparrow (NB)	Winters in hedgerows, pastures, shelterbelts
Mammals		
1	Least Shrew	Shrubby riparian areas
2	Franklin's Ground Squirrel	Open areas near shrubby edges, fencerows, railroad rights-of-way

Table Appendix 19- 3. Habitat Preferences of SGCN - Grassland Habitat

Grassland-Associated SGCN		
Group	Common Name	Comments
Amphibians		
1	Tiger Salamander	All aquatic habitat types, esp. grassland associated wetlands like permanent prairie marshes
2	Great Plains Toad	Grasslands, prairies, farm fields, in vicinity of water
3	Fowler's Toad	Grassy areas near woodland edge, savanna, sandy areas
4	Woodhouse's Toad	Woodland edge, Loess Hills

Grassland-Associated SGCN		
Group	Common Name	Comments
5	Cope's Gray Treefrog	Grasslands, savannas, woodland edges near wetlands
6	Crawfish Frog	Vicinity of prairie marshes, pastures, prairies
7	Northern Leopard Frog	Grasslands, wet meadows during non-breeding season, prairie marshes
8	Plains Spadefoot	Burrows in prairie (outside breeding season)
Reptiles		
1	Ornate Box Turtle	Sand prairie
2	Yellow Mud Turtle	Ephemeral wetlands in sand prairie
3	Slender Glass Lizard	Prairie/savanna with sandy or loose soil
4	Great Plains Skink	Rocky mixed and short grass prairie; prairie-forest edge
5	Northern Prairie Skink	Prairie and oak savanna
6	Six-lined Racerunner	Sand prairie
7	(Prairie) Ringneck Snake	Bluff prairies, oak savanna, grassy woodland edge
8	Western Hognose Snake	Sand prairie
9	Eastern Hognose Snake	Grasslands, savannas, grassy woodland edge
10	Prairie Kingsnake	High quality prairie to oldfield, oak savanna, and grassy woodland edge
11	Speckled Kingsnake	Native prairie to oldfield, oak savanna, and grassy woodland edge
12	Smooth Green Snake	Wet prairie; oldfield
13	Western Rat Snake	Grasslands during summer near wooded valleys
14	Western Fox Snake	Generalist, grasslands, savanna, wetlands, wooded valleys
15	Gopher (Bull) Snake	Sand prairie, bluff prairie, tallgrass prairie, oak savanna, pasture
16	Redbelly Snake	Grasslands, savanna, & woodland edges, near water sources
17	Plains Garter Snake	Generalist, especially in grasslands
18	Lined Snake	Grasslands, pastures, woodland edge
19	Eastern Massasauga Rattlesnake	Wet prairie, upland grassland adjacent to wetland
20	Timber Rattlesnake	Hill prairie within woodland or savanna, with limestone outcrops
21	Prairie Rattlesnake	Loess Hills prairie - mixed and short grass prairie
Birds		
1	Northern Pintail	Nests in grassland
2	Northern Bobwhite	Prefers medium ht. grasslands w/shrubs & forbs
3	Sharp-tailed Grouse (Ex)	Open prairie w/patches of trees or shrubs
4	Greater Prairie-Chicken	Prefers large grassland tracts +2,000 acres
5	Northern Harrier	Prefers large grassland tracts +100 acres
6	Swainson's Hawk	Sparsely treed grasslands, savannas, pastures, wooded farmsteads in open country
7	Yellow Rail (NB)	Wet meadows & fens w/sedges
8	Whooping Crane (NB)	Prefers large wetland complexes w/grasslands adjacent

Grassland-Associated SGCN		
Group	Common Name	Comments
9	Upland Sandpiper	Prefers short-to-medium ht. grasslands w/forbs.
10	Long-billed Curlew (NB)	Short, sparse grasslands with shallow wetlands
11	Pectoral Sandpiper (NB)	Uses wet grasslands, mudflats, and shorelines during migration
12	Buff-breasted Sandpiper (NB)	Uses short grasslands during migration
13	Wilson's Phalarope	Shallow marshes w/upland grass & forbs
14	Burrowing Owl	Prefers short height grasslands
15	Long-eared Owl	Forage in grasslands, also use mixed conifer/deciduous woodlands
16	Short-eared Owl	Prefers large grassland tracts +200 acres
17	Common Nighthawk	Grasslands w/bare areas for nesting
18	Northern Flicker	Open grassy areas near woodland edges, yards, parks
19	American Kestrel	Hunts in open grassland areas, woodland edge
20	Horned Lark	Sparse grasslands, agricultural fields
21	Purple Martin	Forage in open grassy areas
22	Sedge Wren	Prefers tall grass infrequently disturbed
23	Sprague's Pipit (NB)	Open grasslands
24	Smith's Longspur (NB)	Winters in short grasslands
25	Common Yellowthroat	Shrubby grasslands, wet meadows, marshes
26	Field Sparrow	Prefers old grassland fields w/shrubs
27	Grasshopper Sparrow	Prefers short grass w/forbs
28	Henslow's Sparrow	Prefers tall grass and infrequent disturbance; weedy
29	Le Conte's Sparrow (NB)	Prefers grassy meadows; marsh edges
30	Harris's Sparrow (NB)	Winters in pastures, hedgerows
31	Dickcissel	Prefers medium high grass w/sparse forbs
32	Bobolink	Prefers medium height grass w/forbs
33	Eastern Meadowlark	Prefers grass landscape with some trees
34	Western Meadowlark	Grasslands, meadows, pastures
Butterflies		
1	Olympia Marble	Prairies and grasslands
2	Reakirt's Blue	Native prairie
3	Silvery Blue	Open areas near woodlands, open woodlands
4	Melissa Blue	Prairies and grasslands
5	Aphrodite Fritillary	Native prairies, marshes and fens
6	Regal Fritillary	Prairie and open grasslands
7	Silver-bordered Fritillary	Wet meadows, wetlands
8	Gorgone Checkerspot	Xeric prairies
9	Common Ringlet	Prairies and open grassy areas
10	Eyed Brown	Wet meadows and wetlands

Grassland-Associated SGCN		
Group	Common Name	Comments
11	Monarch	Open areas and edges, where nectar is abundant
12	Southern Cloudywing	Open grasslands and woodland openings
13	Mottled Duskywing	Xeric prairie in Loess Hills, gravel ridges
14	Poweshiek Skipper	High quality prairie
15	Ottoe Skipper	Tallgrass prairie
16	Leonard's Skipper	Open grassy areas
17	Dakota Skipper	Tallgrass prairie
18	Crossline Skipper	Dry prairie, bluff prairie
19	Long Dash	Grasslands, wetland edges, roadsides
20	Northern Broken-dash	Grasslands, woodland edges, roadsides
21	Little Glassywing	Open fields, woodland edges
22	Arogos Skipper	Prairies and sand prairies
23	Byssus Skipper	Tallgrass prairie
24	Dusted Skipper	Bluestem grasslands and oldfields
25	Pepper and Salt Skipper	Grasslands, grassland/woodland edges
26	Common Roadside-Skipper	Xeric prairie
Crayfish		
1	Prairie Crayfish	Grasslands and prairies with poorly drained soils
Mammals		
1	Hayden's Shrew	Grasslands, wet meadows, riparian areas, wetlands
2	Elliot's Short-tailed Shrew	Forest, woodland, savanna, grassland
3	Least Shrew	Woodlands, savannas, grasslands, riparian areas
4	White-tailed Jackrabbit	Short grasslands
5	Franklin's Ground Squirrel	Tallgrass prairie, savanna and roadsides
6	Plains Pocket Mouse	Sand and Loess Hills prairies
7	Plains Pocket Gopher	Open grasslands, well drained soils
8	Southern Bog Lemming	Moist grasslands and pastures, wetland margins
9	Long-tailed Weasel	Generalist: grassland marshes
10	Least Weasel	Grassland, grassy riparian areas
11	Spotted Skunk	Grassland, savanna, shrubby woodland, and farmsteads

SGCN Associated with Specific Grassland Habitats

Table Appendix 19- 3- A. Goat and Bluff Prairies

Goat and Bluff Prairies-Associated SGCN		
Group	Common Name	Comments
Reptiles		
1	Common Five-lined Skink	Rocky woodland openings, bluff prairies within woodlands
2	Six-lined Racerunner	Sand prairie, bluff prairie, Loess Hills prairie, savanna
3	(Prairie) Ringneck Snake	Bluff prairies and savannas, adjacent woodlands
4	Eastern Hognose Snake	Oak savannas, woodlands, grasslands, bluff prairies
5	(Bull) Gopher Snake	Sand prairie, bluff prairie, tallgrass prairie, oak savanna, pasture
6	Timber Rattlesnake	Bluff prairies with rocky outcrops
Butterflies		
1	Olympia Marble	Prairies and grasslands
2	Edward's Hairstreak	Woodland clearings
3	Striped Hairstreak	Margins of woodlands - openings and edges of bedrock glades
4	Silvery Blue	Open areas near woodlands, open woodlands
5	Sleepy Duskywing	Dry prairie openings in oak woodlands
6	Columbine Duskywing	Limestone and sandstone glades
7	Ottoe Skipper	Dry prairies in Loess Hills and in NE in limestone and sandstone glades
8	Leonard's Skipper	Dry prairies in Loess Hills, in NE limestone glades
9	Crossline Skipper	Dry prairie, bluff prairie
10	Dusted Skipper	Dry prairie in Loess Hills, in NE limestone and sandstone glades
11	Common Roadside Skipper	Dry prairie

Table Appendix 19- 3- B. Sand Prairies

Sand Prairies-Associated SGCN		
Group	Common Name	Comments
Reptiles		
1	Ornate Box Turtle	Sand prairies
2	Yellow Mud Turtle	Ephemeral wetlands in sand prairie
3	Slender Glass Lizard	Prairie-savanna with sandy or loose soil
4	Six-lined Racerunner	Sand prairie, bluff prairie, Loess Hills prairie, savanna
5	Western Hognose Snake	Shortgrass prairies with sandy soils
6	(Prairie) Kingsnake	Sand prairies, grasslands
7	(Bull) Gopher Snake	Sand prairie, bluff prairie, tallgrass prairie, oak savanna, pasture
Mammals		
1	Plains Pocket Mouse	Sand and Loess Hills prairies

Table Appendix 19- 4. Habitat Preferences of SGCN - Wetlands Habitat

Wetland-Associated SGCN		
Group	Common name	Comments
Amphibians		
1	Smallmouth Salamander	Near woodlands
2	Tiger Salamander	All aquatic habitat types, esp. grassland associated wetlands like permanent prairie marshes
3	Eastern Newt	Well-vegetated, permanent woodland wetlands
4	Blanchard's Cricket Frog	Generalist (but near permanent water source)
5	Crawfish Frog	Permanent grassland wetlands with abundant crayfish burrows
6	Plains Spadefoot	Ephemeral pools for breeding
7	Northern Leopard Frog	Use wetland of prairies, savannas, and woodlands
8	Southern Leopard Frog	Use wetlands, ponds, backwaters, impoundments
Reptiles		
1	Snapping Turtle	Generalist in permanent water sources
2	Blanding's Turtle	Shallow, vegetated, permanent wetlands and ponds with mud bottoms
3	Yellow Mud Turtle	Ephemeral wetlands with sandy soil
4	Eastern Musk Turtle	Oxbows, backwaters, wetlands, ponds that are permanent, mud bottom, near Mississippi River
5	Northern Prairie Skink	Prairie-grasslands, often use wetland edge
6	Plainbelly Water Snake	Backwaters, woodland ponds, in and near Miss. River
7	Diamondback Water Snake	Well-vegetated rivers, oxbows, backwaters, ponds
8	Common Water Snake	Ponds, wetlands, backwaters, and lakes
9	Smooth Green Snake	Prairie-grasslands, often use wetland edge
10	Western Fox Snake	Often use wetland edge
11	Graham's Crayfish Snake	Ponds, wetlands, floodplains, creeks, sandy bottoms, with abundant crayfish burrows
12	Western Ribbon Snake	Marshes, ponds, wetlands, rivers and streams
13	Eastern Massasauga Rattlesnake	Sedge meadow, open marsh edge, near large rivers, backwaters
Birds		
1	Trumpeter Swan	Large prairie marshes w/emergent vegetation
2	American Wigeon	Wetlands and shallow ponds
3	Blue-winged Teal	Marshes, wetlands and shallow ponds
4	Northern Pintail	Prairie marshes w/upland vegetation
5	Canvasback	Bulrush & cattail prairie marsh
6	Redhead	Cattail & bulrush hemi-marshes
7	Ring-necked Duck	Cattail & bulrush hemi-marshes, small lakes and ponds
8	Greater Scaup (NB)	Lakes, rivers, wetlands
9	Red-necked Grebe	Cattail & bulrush hemi-marshes, vegetated shallow lakes

Wetland-Associated SGCN		
Group	Common name	Comments
10	Eared Grebe	Cattail & bulrush hemi-marshes, vegetated Shallow lakes
11	American White Pelican	Riparian areas w/islands
12	American Bittern	Large prairie marshes w/upland grassland
13	Little Blue Heron (NB)	Mudflats, shallow water, dredge spoil islands in rivers
14	Black-crowned Night-Heron	Prairie marshes w/emergent veg. and/or shrubs/trees
15	White-faced Ibis	Prairie marshes with emergent veg, wetlands
16	Northern Harrier	Prairie/grasslands assoc. w/marshes
17	Yellow Rail (NB)	Wet meadows & fens w/sedges
18	Black Rail (NB)	Wet meadows & fens w/ sedges
19	King Rail	Sedge meadow zones of wetland edges
20	Common Gallinule	Prairie hemi-marshes
21	Whooping Crane (NB)	Large wetland complex w/wet meadows/hay fields
22	Black-bellied Plover (NB)	Shallow wetland, usually with mud flats
23	American Golden-Plover (NB)	Mud flats, shallow wetlands
24	Piping Plover	Riparian open, sandy beaches & sandbars
25	Lesser Yellowlegs (NB)	Shallow wetland, usually with mud flats
26	Whimbrel (NB)	Shallow wetland, usually with mud flats
27	Hudsonian Godwit (NB)	Moderate vegetated shorelines of marsh
28	Marbled Godwit (NB)	Moderate vegetated shorelines of marsh
29	Ruddy Turnstone (NB)	Rocky and sandy shores, mudflats
30	Red Knot (NB)	Shallow wetland, usually with mud flats, shorelines
31	Stilt Sandpiper (NB)	Sheltered muddy wetland pools
32	Sanderling (NB)	Mudflats and shorelines
33	White-rumped Sandpiper (NB)	Shallow wetland, usually with mud flats
34	Buff-breasted Sandpiper (NB)	Short-grass areas near water
35	Pectoral Sandpiper (NB)	Shallow wetland, usually with mud flats
36	Semipalmated Sandpiper (NB)	Shallow wetland, usually with mud flats, shorelines
37	Short-billed Dowitcher (NB)	Shallow wetland, usually with mud flats
38	Long-billed Dowitcher (NB)	Shallow wetland, usually with mud flats
39	Wilson's Snipe	Rivers, streams, vegetated wetlands
40	Wilson's Phalarope	Shallow marshes w/upland grass & forbs
41	Franklin's Gull	Wetlands, sandy beaches
42	Least Tern	Open sandy beaches, sandbars of riparian areas
43	Caspian Tern (NB)	Shorelines, riverine islands
44	Black Tern	Large prairie marsh w/emergent vegetation
45	Forster's Tern	Large prairie marsh w/emergent vegetation
46	Sedge Wren	Tall rank grassland ringing marsh

Wetland-Associated SGCN		
Group	Common name	Comments
47	Le Conte's Sparrow (NB)	Prefers grassy meadows; marsh edges
Butterflies		
1	Purplish Copper	Wet-mesic prairies, marshes and wet meadows
2	Acadian Hairstreak	Wet prairies, fens, sedge meadows and marshes
3	Aphrodite Fritillary	Prairie, prairie wetlands, fens
4	Siver-bordered Fritillary	Fens, wet meadows and marshes
5	Baltimore Checkerspot	Fens, wet meadows and marshes
6	Eyed Brown	Marshes, fens, wet prairies
7	Northern Broken-dash	Generalist, including fens, prairies, woodlands
8	Mulberry Wing	Marshes and fens
9	Long Dash	In NE Iowa, associated with fens and wet prairies, although uses dry prairies in NW Iowa
10	Broad-winged Skipper	Marshes and fens
11	Two-spotted Skipper	Fens, wet meadows
12	Black Dash	Fens, wet prairies, marshes
13	Dion Skipper	Wetlands with sedges, fens
Crayfish		
1	Calico Crayfish	Sloughs, floodplains
Dragonflies & Damselflies		
1	Spotted Spreadwing	Wetlands, ephemeral and permanent
2	Amber-winged Spreadwing	Wetlands and ponds
3	Sweetflag Spreadwing	Wetlands
4	Boreal Bluet	
5	Canada Darner	Generalist
6	Swamp Darner	Wooded backwaters
7	Plains Emerald	
8	Carolina Saddlebags	
Fish		
1	Starhead Topminnow	Oxbows
2	Topeka Shiner	Oxbows
Mammals		
1	Hayden's Shrew	Grasslands, wet meadows, wetlands, riparian areas
2	Southern Bog Lemming	Bogs, moist grassland
3	Spotted Skunk	Riparian corridors and wet meadows
4	Plains Pocket Gopher	Wet meadows
5	Long-tailed Weasel	Wetlands, grasslands & woodlands near water
6	Least Weasel	Grassland/wetland margins & riparian corridors

SGCN Associated with Specific Wetland Habitats

Table Appendix 19- 4- A. Fens

Fens-Associated SGCN		
Group	Common Name	Comments
Birds		
1	Yellow Rail (NB)	Fens, wet sedge meadows
Butterflies		
1	Acadian Hairstreak	Wet prairies, fens, sedge meadows and marshes
2	Aphrodite fritillary	Prairies, wetlands, fens
3	Silver-bordered fritillary	Fens, wet prairie, and meadows
4	Baltimore Checkerspot	Wetlands, fens, and bogs
5	Eyed Brown	Fens, wet prairies, and marshes
6	Long Dash	Fens, wet prairies in Northeast (dry prairie in West)
7	Northern Broken-dash	Fens, xeric prairie, forest/woodland
8	Mulberry Wing	Wetlands, fens
9	Broad-winged Skipper	Wetlands, fens
10	Dion Skipper	Sedge wetlands, fens
11	Black Dash	Fens, wet prairies, marshes
12	Two-spotted Skipper	Sedge meadows and marshes, fens

Table Appendix 19- 5. Habitat Preferences of SGCN - Agricultural Lands

Agricultural Lands-Associated SGCN		
Group	Common Name	Comments
Amphibians		
1	Tiger Salamander	All aquatic habitat types, including ponds in pastures and fields
2	Crayfish Frog	Flooded fields, pasture
3	Great Plains Toad	Pasture ponds
4	Plains Spadefoot	Ephemeral pools in ag fields
Reptiles		
1	Ornate Box Turtle	Pasture and agricultural fields with sandy soil
2	Slender Glass Lizard	Pasture and grassland field edges
3	Six-lined Racerunner	Sandy soil in grassland field edges
4	Prairie Kingsnake	Hayfields and grassy field edges
5	(Bull) Gopher Snake	Hayfields and pasture
6	Plains Garter Snake	Uplands- grasslands, farm areas, suburban areas
7	Lined Snake	Grasslands including pastures, suburban areas
8	Eastern Massasauga Rattlesnake	Grassed waterways, grassy field edges
Birds		

Agricultural Lands-Associated SGCN		
Group	Common Name	Comments
1	Northern Pintail	Nests in grassland
2	Northern Bobwhite	Prefers medium height grasslands w/shrubs & forbs, also nests in grassland field edges
3	Sharp-tailed Grouse (Ex)	Open prairie w/patches of trees or shrubs
4	Greater Prairie-Chicken	Prefers large grassland tracts +2,000 acres, pastureland interspersed with native grassland, can nest in grassland field edges and in large CRP grasslands
5	Northern Harrier	Prefers large grassland tracts +100 acres, also nests in large CRP grasslands
6	Swainson's Hawk	Pastures with large trees, grasslands
7	Yellow Rail (NB)	Wet meadows & fens w/sedges
8	Whooping Crane (NB)	Prefers large wetland complexes w/grasslands adjacent, will use pastures and alfalfa fields
9	Upland Sandpiper	Prefers short-to-medium height grasslands w/forbs, will use no-till soybean and alfalfa fields
10	Buff-breasted Sandpiper (NB)	Short-grass areas near water
11	Wilson's Phalarope	Shallow marshes w/upland grass & forbs
12	Burrowing Owl	Prefers short height grasslands, pastures
13	Short-Eared Owl	Prefers large grassland tracts +200 acres, also nests in large CRP grasslands
14	Common Nighthawk	Grasslands w/bare areas for nesting, forages for insects over pastures, hayfields, and croplands
15	Chimney Swift	Declining preference as more chimney availability is reduced, forages for insects over pastures, hayfields and croplands
16	Horned Lark	Sparse grasslands, nests in pastures and no-till soybean fields
17	Sedge Wren	Prefers tall grass infrequently disturbed, nests in older CRP grasslands
18	Field Sparrow	Prefers old grassland fields w/shrubs, nests in older CRP grasslands
19	Grasshopper Sparrow	Prefers short grass w/forbs, can nest in larger grassland field edges or short CRP grasslands
20	Henslow's Sparrow	Prefers tall grass and infrequent disturbance; weedy, will use no-till soybean and alfalfa fields
21	Le Conte's Sparrow (NB)	Prefers grassy meadows, marsh edges
22	Dickcissel	Prefers medium high grass w/sparse forbs, nests in older CRP grasslands and old fields
23	Bobolink	Prefers medium height grass w/forbs, also nests in large, medium height CRP grasslands
24	Eastern Meadowlark	Prefers trees in grass landscape, nests in CRP grasslands and hayfields not cut before mid-July
25	Western Meadowlark	Grasslands, meadows, pastures, nests in CRP grasslands and hayfields not cut before mid-July

Agricultural Lands-Associated SGCN		
Group	Common Name	Comments
Butterflies		
1	Pipevine Swallowtail	Roadsides
2	Purplish Copper	Open fields, pastures
3	Gorgone checkerspot	Oldfields, pastures, roadsides
4	Regal Fritillary	Open grasslands, CRP grasslands
5	Monarch	Open areas and edges, where nectar is abundant, CRP grasslands
6	Dusted Skipper	Oldfields
Mammals		
1	White-tailed Jackrabbit	Fields of small grain, short grass, hayfields, and grassland field edges
2	Franklin's Ground Squirrel	CRP grasslands and hayfields, pasture, and grassland field edges
3	Spotted Skunk	Farmsteads, utilize CRP grasslands, pastures, and grassland field edges
4	Plains Pocket Gopher	Alfalfa fields, CRP grasslands, pastures, and grassland field edges

Table Appendix 19- 6. Habitat Preferences of SGCN - River Habitat
(including Mississippi River pools, and including riparian corridors/floodplains)

River Habitat-Associated SGCN		
Group	Common Name	Comments
Amphibians		
1	Mudpuppy	Clean rivers and streams, especially with rocky or cobblestone bottoms
2	Blanchard's Cricket Frog	Mud banks of rivers, streams, lakes and wetlands
3	Pickerel Frog	Cold, clear-water rivers and streams
4	Northern Leopard Frog	Generalist using many types of water bodies
Reptiles		
1	Snapping Turtle	Generalist using many types of water bodies
2	Wood Turtle	Riparian corridors with adjacent floodplain forest and sandy shores and sandbars for nesting
3	Northern Map Turtle	Rivers and streams with oxbows
4	Southern Map Turtle	Mississippi River and associated oxbows
5	False Map Turtle	Slow moving portions of large rivers and associated oxbows
6	Common Musk Turtle	Slow moving rivers with mud bottoms and oxbows
7	Smooth Softshell	Large rivers preferred with sandy bottoms and level sandbars for nesting
8	Spiny Softshell	Rivers, streams, large lakes and adjacent sandy areas for nesting
9	Plainbelly (Copperbelly) Water Snake	Mississippi River and associated backwaters
10	Diamondback Water Snake	Mississippi and associated large rivers, backwaters, oxbows, ponds

River Habitat-Associated SGCN		
Group	Common Name	Comments
11	Western Ribbon Snake	Wetlands, ponds, rivers, streams
12	Eastern Massasauga	Wetlands adjoining rivers
13	Western Massasauga	Wetlands adjoining rivers
Birds		
1	Greater Scaup (NB)	Rivers, wetlands
2	Lesser Scaup	Mississippi River
3	Common Loon (NB)	In winter - Rivers, lakes, open water
4	American White Pelican	Islands within river corridors
5	Little Blue Heron (NB)	Mudflats, shallow water, dredge spoil islands
6	Black-crowned Night-Heron	Rivers, streams, wetlands
7	Bald Eagle	Riparian forest
8	Red-shouldered Hawk	Riparian forest with sloughs and backwater areas
9	Black-bellied Plover (NB)	Shorelines, flooded fields
10	American Golden-Plover (NB)	Shorelines, agricultural fields, mudflats, beaches, shortgrass grasslands during migration
11	Piping Plover	Sandy beaches, sand bars, Missouri River
12	Lesser Yellowlegs (NB)	Shallow water, shoreline
13	Whimbrel (NB)	Shorelines, beaches
14	Hudsonian Godwit (NB)	Shorelines, mudflats, flooded fields during migration
15	Marbled Godwit (NB)	Shorelines, mudflats, beaches during migration
16	Ruddy Turnstone (NB)	Rocky shorelines during migration
17	Red Knot (NB)	Shorelines
18	Sanderling (NB)	Shorelines
19	Semipalmated Sandpiper (NB)	Shorelines
20	White-rumped Sandpiper (NB)	Shorelines
21	Pectoral Sandpiper (NB)	Shorelines
22	Stilt Sandpiper (NB)	Shorelines
23	Buff-breasted Sandpiper (NB)	Shorelines
24	Short-billed Dowitcher (NB)	Shorelines
25	Long-billed Dowitcher (NB)	Shorelines
26	Wilson's Snipe	Rivers, streams, wetlands
27	American Woodcock	Wooded riparian areas, woodlands
28	Least Tern	Shoreline, sandy beaches, Missouri River
29	Caspian Tern (NB)	Shoreline, riverine islands
30	Belted Kingfisher	Rivers, streams, wetlands
31	Peregrine Falcon	Riparian forest, Mississippi River bluffs
32	Bank Swallow	Rivers and streams

River Habitat-Associated SGCN		
Group	Common Name	Comments
33	Veery	Deciduous wooded shrubby riparian areas
34	Prothonotary Warbler	Wooded backwater areas of bottomland forest
Crayfish		
1	Calico Crayfish	Floodplains of rivers, sloughs
2	Golden Crayfish	Rivers, streams
3	Virile Crayfish	Rivers, streams, ponds
Dragonflies & Damselflies		
1	Midland Clubtail	Rivers, streams
2	Pale Snaketail	Rivers & streams with fast flow & cobble substrate
3	Brimstone Clubtail	Fast flowing, open rivers & streams
4	Elusive Clubtail	Rivers and streams with sandy substrate
5	Arrow Clubtail	Rivers with sandy substrate
6	Stream Cruiser	Medium to large streams & rivers
7	Royal River Cruiser	Rivers, streams, lakes
8	Smoky Shadowdragon	Rivers and larger sized streams with fast flow
9	Stygian Shadowdragon	Mississippi River
Fish		
1	Chestnut lamprey	Rivers, including Mississippi
2	Silver lamprey	Mississippi River, spawn in shallow streams and tributaries on gravel riffles
3	Lake sturgeon	Large rivers and lakes with sand, cobble and rock substrate
4	Pallid sturgeon	Missouri River. Turbid waters with sand and gravel substrate
5	Shovelnose sturgeon	Large rivers, turbid waters
6	Paddlefish	Medium to large rivers, backwater, and impoundments
7	American Eel	Rivers, large streams and lakes
8	Skipjack herring	Medium to large rivers and large impoundments with sand and gravel substrate
9	Gravel chub	Large streams and rivers with gravel substrate
10	Plains minnow	Silt bottom
11	Pallid shiner	Rivers and streams, sand and muck bottom
12	Redfin shiner	Rivers and streams, sand and muck bottom
13	Shoal chub	Rivers, sand, cobble and silt substrate
14	Sturgeon chub	Warm, turbid rivers
15	Sicklefin chub	Large, turbid rivers with sand and gravel substrate
16	Ghost shiner	Rivers, streams
17	Blacknose shiner	Cool vegetated waters with sand bottom
18	Ozark minnow	Gravel and rock substrate
19	Silverband shiner	Open channels/swift currents, tolerates silt

River Habitat-Associated SGCN		
Group	Common Name	Comments
20	Weed shiner	Rivers, streams, sand substrate
21	Topeka shiner	Rivers, streams with clear waters, off-channel areas
22	Channel shiner	
23	Pugnose minnow	Clear vegetated waters with silt, sand and gravel substrate
24	Flathead chub	Turbid rivers
25	Longnose dace	Clear waters with gravel and rock substrate
26	Blue sucker	Large rivers
27	Black buffalo	Rivers, impoundments, backwaters
28	Spotted sucker	Rivers, streams, firm substrate
29	River redhorse	Clear rivers and streams with no silt
30	Black redhorse	Rivers, streams, gravel and rock substrate
31	Blue catfish	Rivers, backwaters
32	Slender madtom	Rivers, streams
33	Tadpole madtom	Vegetated rivers, streams, lakes, impoundments, backwaters with slow flow & muck substrate
34	Freckled madtom	Rivers, streams
35	Brook trout	Cool rivers and streams with sand, gravel, cobble or rock substrate and moderate to fast flow
36	Trout perch	Rivers, streams, sand substrate
37	Burbot	Deep, cold rivers & lakes
38	Northern (longear) sunfish	
39	Western sand darter	Rivers with sand substrate, slow to moderate flow
40	Crystal darter	Streams, small rivers with sand and gravel substrate
41	Mud darter	Rivers, backwaters, sand and muck substrate
42	Bluntnose darter	Streams, small to medium rivers, backwaters, sand, muck substrate, slow flow
43	Orangethroat darter	Streams to small rivers with sand, cobble, gravel and bedrock substrate and moderate to fast flow
44	Banded darter	Rivers, streams, cobble and gravel substrate
45	Logperch	Rivers, streams, lakes, impoundments, sand and gravel substrate
46	Blackside darter	Rivers, streams, sand and gravel substrate
47	Slenderhead darter	Rivers, streams, cobble, gravel and bedrock substrate
48	River darter	Large rivers, gravel and rock substrate
Mammals		
1	Indiana Bat	Wooded riparian areas
2	Silver-haired Bat	Wooded riparian areas
3	Eastern Pipistrelle	Wooded riparian areas
4	Evening Bat	Wooded riparian areas

River Habitat-Associated SGCN		
Group	Common Name	Comments
5	Ermine	Wooded riparian areas
Mussels		
1	Mucket	Medium to large rivers, firm gravel substrate
2	Three Ridge	Small to large rivers and lakes with gravel, sand or mud substrate
3	Flat floater	Rivers, lakes, ponds, mud and silt substrate, slow or no flow
4	Rock pocketbook	Medium to large rivers, mud and sand substrate
5	Spectacle case	Large rivers, mud and sand substrate
6	Purple wartyback	Medium to large rivers, gravel substrate
7	Butterfly	Large rivers, sand and gravel substrate
8	Elephant ear	Large rivers, mud, sand, and gravel substrate
9	Snuffbox	Medium to large rivers, gravel substrate
10	Ebonyshell	Large, deep rivers, sand and gravel substrate
11	Higgins' eye pearlymussel	Large rivers, sand and gravel substrate
12	Fatmucket	Small to large rivers and streams, lakes, reservoirs
13	Yellow sandshell	Medium to large rivers, sand and gravel substrate
14	White heelsplitter	Medium to large rivers, mud, gravel substrate
15	Fluted shell	Medium to large rivers, mud sand and gravel substrate
16	Black sandshell	Medium to large rivers, gravel, firm sand substrate
17	Washboard	Large rivers, gravel, mud substrate
18	Threehorn wartyback	Medium to large rivers, gravel substrate
19	Hickorynut	Large rivers, sand and gravel substrate
20	Bullhead (Sheepnose)	Medium to large rivers, sand and gravel substrate
21	Pyramid pigtoe	Large rivers, gravel-sand substrate
22	Round pigtoe	Rivers, streams, firm sand and gravel substrate
23	Pink heelsplitter	Medium to large rivers
24	Pink papershell	Medium to large rivers
25	Monkeyface	Medium to large rivers, gravel substrate
26	Wartyback	Large rivers, sand and gravel substrate
27	Pimpleback	Rivers, streams
28	Mapleleaf	Medium to large rivers, gravel, sand substrates
29	Salamander mussel	Rivers
30	Pistolgrip	Medium to large rivers, mud, sand and gravel substrate
31	Fawnsfoot	Medium to large rivers , sand and gravel substrate
32	Deertoe	Medium to large rivers, mud, sand, and gravel substrates
33	Pondhorn	Inland rivers, streams, ponds, muck and sand substrate
34	Paper pondshell	Mud substrate

Table Appendix 19- 7. Habitat Preferences of SGCN - Stream Habitat
(including riparian corridors/floodplains)

Stream Habitat-Associated SGCN		
Group	Common Name	Comments
Amphibians		
1	Common Mudpuppy	Permanent rivers & streams with gravel bottoms
2	Blanchard's Cricket frog	Mud banks of rivers, streams, lakes and wetlands
3	Crawfish Frog	Streams or ponds within grasslands (presumed extirpated)
4	Pickerel Frog	Cold water streams, rivers, and impoundments
5	Northern Leopard Frog	All aquatic habitat types
Reptiles		
1	Snapping turtle	Uses most types of water bodies
2	Wood turtle	Rivers and streams and adjacent floodplains
3	Northern map turtle	Rivers and streams
4	Spiny softshell	Rivers, streams, large lakes
5	Western worm snake	Woodland-savanna-grassland riparian areas
6	Common water snake	Streams, backwaters, ponds, marshes, lakes
7	Western fox snake	Woodland-savanna-grassland riparian areas
8	Graham's crayfish snake	Floodplains of streams, creeks, wetlands, sloughs
9	Western ribbon snake	Rivers, streams, wetlands, ponds
10	Smooth earth snake	Moist deciduous forests and edge habitats, often in valleys of wooded rivers and streams
Birds		
1	Little Blue Heron (NB)	Mudflats, shallow water, dredge spoil islands
2	Black-crowned Night-Heron	Rivers, streams, wetlands
3	Bald Eagle	Riparian forest
4	Red-shouldered Hawk	Riparian forest
5	Black-bellied Plover (NB)	Shorelines, flooded fields
6	American Golden-Plover (NB)	Shorelines, agricultural fields, mudflats, beaches, shortgrass grasslands during migration
7	Lesser Yellowlegs (NB)	Shallow water
8	Whimbrel (NB)	Shorelines, beaches
9	Hudsonian Godwit (NB)	Shorelines, mudflats, flooded fields during migration
10	Marbled Godwit (NB)	Shorelines, mudflats, beaches during migration
11	Ruddy Turnstone (NB)	Rocky shorelines during migration
12	Red Knot (NB)	Shorelines
13	Sanderling (NB)	Shorelines
14	Semipalmated Sandpiper (NB)	Shorelines
15	White-rumped Sandpiper (NB)	Shorelines
16	Pectoral Sandpiper (NB)	Shorelines

Stream Habitat-Associated SGCN		
Group	Common Name	Comments
17	Stilt Sandpiper (NB)	Shorelines
18	Buff-breasted Sandpiper (NB)	Shorelines
19	Short-billed Dowitcher (NB)	Shorelines
20	Long-billed Dowitcher (NB)	Shorelines
21	Wilson's Snipe	Rivers, streams, wetlands
22	American Woodcock	Wooded riparian areas, woodlands
23	Caspian Tern (NB)	Shoreline, riverine islands
24	Belted Kingfisher	Rivers, streams, wetlands
25	Peregrine Falcon	Riparian forest, Mississippi River bluffs
26	Acadian Flycatcher	Deciduous, wooded riparian areas
27	Bank Swallow	Nests in cut-banks of rivers and streams
28	Veery	Deciduous wooded riparian areas
29	Prothonotary Warbler	Bottomland forest; wooded backwater areas of rivers and streams
Butterflies		
1	Zebra Swallowtail	Riparian woodlands
2	Harvester	Wooded streams
3	Acadian Hairstreak	Riparian areas in woodlands or grasslands
4	Striped Hairstreak	Streamside prairies, woodland openings & edges
5	Hayhurst's Scallopwing	Floodplain forest
Crayfish		
1	Devil Crayfish	Streams, creeks
2	Calico Crayfish	Floodplains, sloughs
3	Golden Crayfish	Rivers, streams and creeks
4	Northern Clearwater Crayfish	Cool water streams
5	Virile Crayfish	Rivers, streams, and ponds
Dragonflies & Damselflies		
1	Paiute dancer	Small streams, marshy springs
2	Boreal bluet	Streams with slow flow, fishless ponds, lakes
3	Western forktail	Heavily vegetated ponds, lakes, and slow flow streams with mud substrate
4	Variable darner	Lakes, ponds, streams
5	Midland clubtail	Rivers and streams
6	Sulphur-tipped clubtail	Ponds, lakes, streams, and creeks with mud substrate
7	Rapids clubtail	Rocky creeks
8	Rusty snaketail	Sandy or rocky creeks
9	Pale snaketail	Rivers and streams with fast flow and cobble substrate
10	Sioux snaketail	Streams with sandy bottoms

Stream Habitat-Associated SGCN		
Group	Common Name	Comments
11	Westfall's snaketail	Clear forest streams with strong riffles and cobble substrate
12	Brimstone clubtail	Strong-flowing, open streams and rivers
13	Elusive clubtail	Rivers and streams with sandy substrate
14	Arrow clubtail	Rivers with sandy substrate
15	Stream cruiser	Rivers and streams
16	Smoky shadowdragon	Fast-flowing rivers and streams
17	Plains emerald	Streams
Fish		
1	Northern brook lamprey	Streams with muck bottoms
2	American brook lamprey	Small to medium rivers & streams
3	American eel	Rivers, large streams, lakes
4	Largescale stoneroller	Clear, medium to large streams, gravel substrate
5	Gravel chub	Large streams and rivers, gravel substrate
6	Plains minnow	Rivers and streams with slow flows, silt bottoms
7	Redfin shiner	Rivers, streams, and creeks
8	Ghost shiner	Rivers, streams
9	Blacknose shiner	Cool water streams, sand substrate
10	Ozark minnow	Fast moving streams with gravel or rock substrate
11	Weed shiner	Rivers and streams with sand bottoms
12	Topeka shiner	Slow-flowing rivers & streams with clear water, off-channel areas
13	Pugnose minnow	Vegetated lakes, impoundments, streams with slow flow
14	Southern redbelly dace	
15	Longnose dace	Fast moving rivers and streams with clear water and gravel or rock bottoms
16	River redhorse	Large streams and rivers with clear water
17	Black redhorse	Rivers and streams with gravel or rock bottoms
18	Brown bullhead	Slow moving streams, lakes, ponds, backwaters, impoundments
19	Slender madtom	Rivers and streams with moderate to fast flow
20	Tadpole madtom	Slow moving rivers and streams, backwaters, impoundments, vegetated lakes
21	Freckled madtom	Rivers and streams with moderate to slow flow
22	Central mudminnow	Vegetated streams and backwaters
23	Brook trout	Cold and cool water streams and rivers with moderate to fast flow and sand, gravel or rock substrate
24	Trout perch	Rivers and streams with sand substrate
25	Banded killifish	Lakes, ponds, streams with slow flow
26	Starhead topminnow	Backwaters, streams and creeks with muck bottoms and slow to no flow

Stream Habitat-Associated SGCN		
Group	Common Name	Comments
27	Blackstripe topminnow	Turbid streams
28	Plains topminnow	Clear prairie streams with moderate flow
29	Mottled sculpin	Clear, cool water rivers and streams with sand, gravel or rock substrate
30	Slimy sculpin	Cold, fast flowing streams with rock substrate
31	Bluntnose darter	Rivers, streams, and backwaters with sand or muck bottoms
32	Iowa darter	Cool water streams, ponds and lakes with no or slow flow and muck or sand bottoms
33	Least darter	Vegetated creeks with slow flow
34	Orangethroat darter	Rivers and streams with moderate to fast flow and sand, coble, gravel or bedrock substrate
35	Banded darter	Large streams and rivers with moderate flow and gravel or cobble substrate
36	Logperch	Rivers and streams, lakes and impoundments, sand or gravel substrate
37	Blackside darter	Small rivers and streams with slow flow and sand or gravel substrate
38	Slenderhead darter	Rivers and streams with moderate to fast flow and cobble, gravel or bedrock substrate
Mammals		
1	Indiana Bat	Wooded riparian areas
2	Silver-haired Bat	Wooded riparian areas
3	Eastern Pipistrelle	Wooded riparian areas
4	Evening Bat	Wooded riparian areas
5	Ermine	Wooded riparian areas
Mussels		
1	Elktoe	Streams, sand and gravel substrate
2	Slippershell	Streams and creeks, mud and sand substrate
3	Clyinder	Small creeks, mud and sand substrate
4	Spike	Streams and lakes, firm sand and gravel substrate
5	Wabash pigtoe	Rivers, streams, creeks, gravel and sand substrate
6	Fatmucket	Rivers, streams, resevoirs
7	Creek heelsplitter	Streams and creeks, sand and gravel substrate
8	Pondmussel	Small creeks and ponds, sand and muck substrate
9	Round pigtoe	Rivers and streams, firm sand and gravel substrate
10	Pimpleback	Small streams to large rivers
11	Strange floater	Small to medium streams, mud, sand and gravel substrate
12	Deertoe	Medium streams to large rivers, mud, gravel sand substrate
13	Pondhorn	Ponds, creeks, streams, rivers, muck and sand substrate

Stream Habitat-Associated SGCN		
Group	Common Name	Comments
14	Ellipse	Small to medium streams, sand and gravel substrate

Table Appendix 19- 8. Habitat Preferences of SGCN – Lakes, Flood Control Reservoirs, On-stream Impoundments, and Surface Mines.

(This table includes species using shoreline and immediately adjacent uplands.)

Lakes, Reservoirs, Impoundments & Surface Mines-Associated SGCN		
Group	Common Name	Comments
Amphibians		
1	Tiger salamander	All aquatic habitat types, esp. permanent wetlands like lakes, ponds, and prairie marshes
2	Common mudpuppy	On-stream impoundments with gravel bars for reproduction
3	Blanchard’s cricket frog	Rivers, streams, lakes, wetlands
4	Pickerel frog	On-stream impoundments, cold water rivers, streams
5	Northern leopard frog	All aquatic habitats
6	Southern leopard frog	On-stream impoundments, wetlands, ponds, backwaters
Reptiles		
1	Snapping turtle	All aquatic habitat types
2	Spiny softshell	Large lakes, rivers, streams
3	Prairie skink	Grasslands with loose soil and rocky areas adjacent to marshes or lakes
4	Speckled kingsnake	Grassy uplands adjacent to lakes and large ponds
5	Common water snake	Lakes, ponds, wetlands, streams, backwaters
6	Smooth green snake	Grassy uplands adjacent to lakes and impoundments
7	Western fox snake	Grassy uplands adjacent to lakes and wetlands
8	(Northern) Redbelly snake	Grassy uplands adjacent to lakes and wetlands
Birds		
1	Greater Scaup (NB)	Rivers, lakes, wetlands
2	Common Loon (NB)	Large clear lakes in summer. In winter - lakes rivers, open water
3	American White Pelican	Reservoirs, impoundments, rivers
4	Little Blue Heron (NB)	Mudflats, shallow water, dredge spoil islands
5	Bald Eagle	Reservoirs, impoundments with forested edges
6	Black-bellied Plover (NB)	Shorelines, flooded fields
7	American Golden-Plover (NB)	Shorelines, agricultural fields, mudflats, beaches, shortgrass grasslands during migration
8	Lesser Yellowlegs (NB)	Shallow water, wetland edges
9	Whimbrel (NB)	Shorelines, beaches
10	Hudsonian Godwit (NB)	Shorelines, mudflats, flooded fields during migration
11	Marbled Godwit (NB)	Shorelines, mudflats, beaches during migration

Lakes, Reservoirs, Impoundments & Surface Mines-Associated SGCN		
Group	Common Name	Comments
12	Ruddy Turnstone (NB)	Rocky shorelines during migration
13	Red Knot (NB)	Shorelines, wetland edges
14	Sanderling (NB)	Shorelines, wetland edges
15	Semipalmated Sandpiper (NB)	Shorelines, wetland edges
16	White-rumped Sandpiper (NB)	Shorelines, wetland edges
17	Pectoral Sandpiper (NB)	Shorelines, wetland edges
18	Stilt Sandpiper (NB)	Shorelines, wetland edges
19	Buff-breasted Sandpiper (NB)	Short-grass areas near water
20	Short-billed Dowitcher (NB)	Shorelines, wetland edges
21	Long-billed Dowitcher (NB)	Shorelines, wetland edges
22	Caspian Tern (NB)	Shoreline, riverine islands
23	Bank Swallow	Reservoirs, quarries, exposed banks near water
Dragonflies & Damselflies		
1	Boreal bluet	Ponds, lakes
2	Western forktail	Vegetated ponds, lakes, and slow flow streams with mud substrate
3	Variable darner	Lakes, ponds, streams
4	Sulphur-tipped clubtail	Ponds, lakes, streams with mud substrate
5	Royal river cruiser	Lakes, rivers
6	Slender baskettail	Lakes, ponds, backwaters
Fish		
1	Silver lamprey	Rivers, impoundments, lakes
2	Lake sturgeon	Large rivers and lakes
3	Paddlefish	Impoundments
4	American eel	Rivers, large streams and lakes
5	Skipjack herring	Large rivers and impoundments
6	Pearl dace	Ponds and small lakes
7	Pugnose shiner	Clear, vegetated lakes
8	Blacknose shiner	Cool water rivers, streams and lakes
9	Pugnose minnow	Vegetated lakes, impoundments, and streams
10	Black buffalo	Rivers, impoundments, backwaters
11	Brown bullhead	Ponds, lakes, backwaters, impoundments, streams
12	Tadpole madtom	Vegetated lakes, impoundments, backwaters, rivers and streams
13	Redfin (Grass) pickerel	Vegetated backwaters, ponds, and small lakes
14	Pirate perch	Vegetated lakes, ponds, and backwaters
15	Burbot	Deep, cold lakes and rivers
16	Banded killifish	Lakes, ponds, and streams
17	Iowa darter	Cool creeks, ponds, and lakes

Lakes, Reservoirs, Impoundments & Surface Mines-Associated SGCN		
Group	Common Name	Comments
18	Logperch	Rivers, streams, lakes and impoundments
Mussels		
1	Fatmucket	Rivers, streams, lakes, reservoirs
2	Paper pondshell	Lakes, ponds, rivers, impoundments

Table Appendix 19- 9. Habitat Preferences of SGCN – Backwater and Oxbow Habitats

Backwater and Oxbow Habitats-Associated SGCN		
Group	Common Name	Comments
Amphibians		
1	Tiger salamander	Generalist using many types of water bodies
2	Northern leopard frog	Generalist using many types of water bodies
3	Southern leopard frog	Wetlands, ponds, backwaters, impoundments
Reptiles		
1	Snapping turtle	Generalist using many types of water bodies
2	Southern map turtle	Mississippi River and associated oxbows
3	False map turtle	Slow portions, especially oxbows, of large rivers
4	Eastern musk turtle	Herbaceous wetlands, backwaters, and spring fed ponds adjacent to sandy uplands
5	Plainbelly (Copperbelly) Water Snake	Mississippi River and associated backwaters and wet woodland
6	Diamondback Water Snake	Rivers, ponds, backwaters, oxbows
7	Common water snake	Lakes, ponds, marshes, streams, backwaters
Dragonflies & Damselflies		
1	Slender baskettail	Lakes, ponds, backwaters
Fish		
1	Paddlefish	Medium to large rivers, backwater, and impoundments
2	Western silvery minnow	Backwaters with sand or muck substrate
3	Mississippi silvery minnow	Backwaters
4	Topeka shiner	Rivers, streams, oxbows
5	Black buffalo	Backwaters, rivers, and impoundments
6	Brown bullhead	Ponds, lakes, backwaters, impoundments, and streams
7	Blue catfish	Rivers and backwaters
8	Tadpole madtom	Vegetated lakes, impoundments, backwaters, creeks, and rivers
9	Grass pickerel	Vegetated backwaters, ponds, and small lakes
10	Central mudminnow	Vegetated streams and backwaters
11	Pirate perch	Vegetated lakes, ponds, and backwaters
12	Starhead topminnow	Heavily vegetated creeks, oxbows, and backwaters, muck bottoms

Backwater and Oxbow Habitats-Associated SGCN		
Group	Common Name	Comments
13	Blackstripe topminnow	Turbid backwaters and streams
14	Plains topminnow	Clear, quiet, vegetated backwaters
15	Mud darter	Rivers and backwaters
16	Bluntnose darter	Medium or smaller sized rivers, streams, backwaters

Table Appendix 19- 10. Habitat Preferences of SGCN - Pond Habitat

Pond Habitat-Associated SGCN		
Group	Common Name	Comments
Amphibians		
1	Tiger salamander	All aquatic habitat types, esp. permanent wetlands including lakes, ponds, and prairie marshes
2	Blanchard's cricket frog	Mud banks of ponds, lakes, streams, wetlands
3	Crawfish frog (Ex)	Ponds & streams within grasslands and with abundant crayfish
4	Pickerel frog	Cold water streams, rivers, impoundments and ponds
5	Northern leopard frog	All aquatic habitat types
6	Southern leopard frog	Wetlands, ponds, backwaters, impoundments
Reptiles		
1	Snapping turtle	Aquatic habitat generalist
2	Blanding's turtle	Well-vegetated, shallow wetlands. Ponds have more limited use in Iowa by Blanding's.
3	Eastern musk turtle	Spring fed ponds near sandy uplands
4	Prairie kingsnake	Grasslands near lakes or large ponds
5	Diamondback water snake	Rivers, backwaters, oxbows, ponds
6	Common water snake	Lakes, ponds, marshes, streams, backwaters
7	Graham's crayfish snake	Ponds, sloughs, wetlands, floodplains, creeks
8	(Northern) Redbelly Snake	Woodland and adjacent grasslands near water
9	Western ribbon snake	Herbaceous wetland, ponds, streams, rivers
Birds		
1	Trumpeter Swan	Wetlands, ponds
2	Purple Martin	Ponds near towns
Crayfish		
1	Virile crayfish	Rivers, streams, ponds lacking predatory fish
Dragonflies & Damselflies		
1	Spotted spreadwing	Ponds
2	Amber-winged spreadwing	Shallow ponds and wetlands
3	Sweetflag spreadwing	
4	Prairie bluet	

Pond Habitat-Associated SGCN		
Group	Common Name	Comments
5	Taiga bluet	Ponds and wetlands
6	Boreal bluet	Fishless ponds, lakes, and slow flow streams
7	Alkali bluet	Ponds and lakes
8	Western forktail	Heavily vegetated ponds, lakes, and slow flow streams with mud substrate
9	Sedge sprite	Ponds and wetlands
10	Canada darner	Wetlands, pond edges
11	Variable darner	Lakes, ponds, streams
12	Sulphur-tipped clubtail	Ponds, lakes, streams with mud substrate
13	Slender baskettail	Lakes, ponds, and backwaters
Fish		
1	Pearl dace	Ponds and small lakes
2	Brown bullhead	Ponds, lakes, backwaters, impoundments, and streams
3	Grass pickerel	Vegetated backwaters, ponds, and small lakes
4	Pirate perch	Vegetated lakes, ponds, and backwaters
5	Banded killifish	Lakes, ponds, streams
6	Iowa darter	Cool creeks, ponds, and lakes
Mussels		
1	Flat floater	Ponds, lakes, rivers
2	Pondmussel	Small creeks and ponds
3	Pondhorn	Ponds, creeks, streams, rivers
4	Paper pondshell	Ponds, lakes, impoundments, rivers

Table Appendix 19- 11. Summary of Habitat Preferences of SGCN by Habitat Class.

Individual species are assigned to more than one habitat type if appropriate, so the total number of species exceeds the total number of SCCN.

Habitat Class	Amphibians	Reptiles	Birds	Butterflies	Crayfish	Dragonflies & Damselflies	Fish	Mammals	Mussels	Terrestrial Snails	Total
Terrestrial Habitat Classes	28	55	149	56	2	8	2	35	0	5	340
Forests	7	10	29	11	-	-	-	12	-	5	74
Shrubland	1	3	14	-	-	-	-	2	-	-	20
Grasslands	8	21	34	26	1	-	-	11	-	-	101
Wetlands	8	13	47	13	1	8	2	6	-	-	98
Agricultural Lands	4	8	25	6	-	-	-	4	-	-	47
Aquatic Habitat Classes	23	47	88	5	9	46	126	10	54	0	408
River	4	13	34	-	3	9	48	5	34	-	150
Stream	5	10	29	5	5	17	38	5	14	-	128
Lake, Reservoir, Impoundment	6	8	23	-	-	6	18	-	2	-	63
Backwater/Oxbow	2	7	-	-	-	1	16	-	-	-	26
Pond	6	9	2	-	1	13	6	-	4	-	41
Total	51	102	237	61	11	54	128	45	54	5	748

Appendix 20. Level II Threats to Iowa's Wildlife

Appendix 21- 1. Level II Threats to Amphibians

Impact level: L = Low, M = Medium, H = High, VH = Very High (Negligible threats demarked with a dash)

Level II Threats – Amphibians	Grassland	Rowcrop	Wetland	Woodland
1.1 Housing & Urban Areas	M	L	L	H
1.2 Commercial & Industrial Areas	L	L	L	-
1.3 Tourism & Recreation Areas	L	-	M	L
2.1 Annual & Perennial Non-Timber Crops	VH	NA	H	H
2.2 Wood & Pulp Plantations	-	-	-	-
2.3 Livestock Farming & Ranching	M-L	Not a Threat	L	H
2.4 Marine & Freshwater Aquaculture	-	-	-	-
3.1 Oil & Gas Drilling	-	-	-	-
3.2 Mining & Quarrying	L	-	L	L
3.3 Renewable Energy	L	-	-	L
4.1 Roads & Railroads	M	L	H	VH
4.2 Utility & Service Lines	-	L	L	L
4.3 Shipping Lanes	-	-	-	-
4.4 Flight Paths	-	-	L	-
5.1 Hunting & Collecting Terrestrial Animals	L	-	M	L
5.2 Gathering Terrestrial Plants	-	-	-	-
5.3 Logging & Wood Harvesting	-	-	-	H-L
5.4 Fishing & Harvesting Aquatic Resources	-	-	-	-
6.1 Recreational Activities	L	L	-	L
6.2 War, Civil Unrest & Military Exercises	-	-	-	-
6.3 Work & Other Activities	-	VH	-	-
7.1 Fire & Fire Suppression	M	-	L	H-M
7.2 Dams & Water Management/Use	-	VH	H	L
7.3 Other Ecosystem Modifications	M	-	L	H
7.4 Removing/Reducing Human Maintenance	M	Not a Threat	M-L	H
8.1 Invasive Non-native Alien Plants & Animals	L	Unknown	H	H
8.2 Problematic Native Plants & Animals	L	-	M	H
8.3 Introduced Genetic Material	-	Unknown	-	-
8.4 Pathogens & Microbes	L	Unknown	L	H
9.1 Household Sewage & Urban Waste Water	-	-	M	L
9.2 Industrial & Military Effluents	-	-	L	L
9.3 Agricultural & Forestry Effluents	-	L	H	M

Level II Threats – Amphibians	Grassland	Rowcrop	Wetland	Woodland
9.4 Garbage & Solid Waste	-	-	-	-
9.5 Air-borne Pollutants	L	M-L	-	L
9.6 Excess Energy	-	-	-	-
10.1 Volcanoes	-	-	-	-
10.2 Earthquakes/tsunamis	-	-	-	-
10.3 Avalanches/mudslides	-	-	-	-
11.1 Ecosystem Encroachment	Not a threat within next 10 years	Not a threat within next 10 years	Not a threat within next 10 years	Not a threat within next 10 years
11.2 Changes in Geochemical Regimes	Unknown	Unknown	Unknown	H
11.3 Changes in Temperature Regimes	M	M-L	H-M	Not a Threat
11.4 Changes in Precipitation & Broad-scale Hydrological Regimes	H	H	H-M	Not a Threat
11.5 Severe/extreme Weather Events	L	H	L	M

Appendix 21- 2. Level II Threats to Reptiles

Impact level: L = Low, M = Medium, H = High, VH = Very High (Negligible threats demarked with a dash)

Level II Threats – Reptiles	Grassland	Rivers	Rowcrop	Wetland	Woodland
1.1 Housing & Urban Areas	M	L	L	L	M
1.2 Commercial & Industrial Areas	L	L	L	L	-
1.3 Tourism & Recreation Areas	L	-	-	M	L
2.1 Annual & Perennial Non-Timber Crops	VH	H	NA	H	H
2.2 Wood & Pulp Plantations	-	-	-	-	-
2.3 Livestock Farming & Ranching	M	H-M	Not a Threat	H-M	H
2.4 Marine & Freshwater Aquaculture	-	L	-	L	-
3.1 Oil & Gas Drilling	-	-	-	-	-
3.2 Mining & Quarrying	L	-	-	L	L
3.3 Renewable Energy	M	-	-	L	L
4.1 Roads & Railroads	H	M	L	H	H
4.2 Utility & Service Lines	L	L	L	L	L
4.3 Shipping Lanes	-	L	-	-	-
4.4 Flight Paths	-	-	-	L	-
5.1 Hunting & Collecting Terrestrial Animals	H	L	-	L	L
5.2 Gathering Terrestrial Plants	-	-	-	-	-
5.3 Logging & Wood Harvesting	Not a Threat	-	-	-	Not a Threat

Level II Threats – Reptiles	Grassland	Rivers	Rowcrop	Wetland	Woodland
5.4 Fishing & Harvesting Aquatic Resources	-	VH	-	H	-
6.1 Recreational Activities	L	-	L	L	M
6.2 War, Civil Unrest & Military Exercises	-	-	-	-	-
6.3 Work & Other Activities	H	-	VH	-	-
7.1 Fire & Fire Suppression	VH	-	-	L	H
7.2 Dams & Water Management/Use	-	M	M	H	L
7.3 Other Ecosystem Modifications	H	L	-	L	M-L
7.4 Removing/Reducing Human Maintenance	H	Not a Threat	Not a Threat	M-L	M
8.1 Invasive Non-native Alien Plants & Animals	H	-	Unknown	H-L	H
8.2 Problematic Native Plants & Animals	H	H	-	H	H
8.3 Introduced Genetic Material	-	Unknown	Unknown	Unknown	-
8.4 Pathogens & Microbes	L	L	-	L	M-L
9.1 Household Sewage & Urban Waste Water	L	M-L	-	M	L
9.2 Industrial & Military Effluents	L	L	-	L	L
9.3 Agricultural & Forestry Effluents	L	H	L	H	L
9.4 Garbage & Solid Waste	L	L	-	-	L
9.5 Air-borne Pollutants	M	-	L	H	L
9.6 Excess Energy	-	L	-	-	-
10.1 Volcanoes	-	-	-	-	-
10.2 Earthquakes/tsunamis	-	-	-	-	-
10.3 Avalanches/mudslides	-	-	-	-	-
11.1 Ecosystem Encroachment	Not a threat within the next 10 years	Not a threat within the next 10 years	Not a threat within the next 10 years	Not a threat within the next 10 years	Not a threat within the next 10 years
11.2 Changes in Geochemical Regimes	Unknown	Unknown	Unknown	Unknown	Unknown
11.3 Changes in Temperature Regimes	M	L	M	H-M	M
11.4 Changes in Precipitation & Broad-scale Hydrological Regimes	H	H-M	H	H-M	H
11.5 Severe/extreme Weather Events	M	H	M	M	M

Appendix 21- 3. Level II Threats to Birds

Impact level: L = Low, M = Medium, H = High, VH = Very High (Negligible threats demarked with a dash)

Level II Threats – Birds	Grassland	Shrubland	Rowcrop	Woodland	Wetland
1.1 Housing & Urban Areas	L	M	L	M	L
1.2 Commercial & Industrial Areas	L	L	L	-	L
1.3 Tourism & Recreation Areas	L	L	-	L	-
2.1 Annual & Perennial Non-Timber Crops	VH	H	NA	H	H
2.2 Wood & Pulp Plantations	-	-	-	-	-
2.3 Livestock Farming & Ranching	H	M	Not a Threat	H	M
2.4 Marine & Freshwater Aquaculture	-	-	Not a Threat	-	Not a Threat
3.1 Oil & Gas Drilling	-	-	-	-	-
3.2 Mining & Quarrying	L	-	-	L	L
3.3 Renewable Energy	M	-	L	L	M
4.1 Roads & Railroads	M	M	-	H	H
4.2 Utility & Service Lines	L	L	L	L	M
4.3 Shipping Lanes	-	-	Not a Threat	-	Not a Threat
4.4 Flight Paths	-	-	-	-	L
5.1 Hunting & Collecting Terrestrial Animals	-	-	-	Not a Threat	-
5.2 Gathering Terrestrial Plants	-	-	-	-	-
5.3 Logging & Wood Harvesting	-	-	-	H-M	-
5.4 Fishing & Harvesting Aquatic Resources	-	-	Not a Threat	-	L
6.1 Recreational Activities	L	L	L	H-L	L
6.2 War, Civil Unrest & Military Exercises	-	-	Not a Threat	-	-
6.3 Work & Other Activities	H	-	M	-	-
7.1 Fire & Fire Suppression	VH	H	-	H	M
7.2 Dams & Water Management/Use	-	L	VH	-	H
7.3 Other Ecosystem Modifications	H-M	L	L	H-M	L
7.4 Removing/Reducing Human Maintenance	H	L	Not a Threat	M	L
8.1 Invasive Non-native Alien Plants & Animals	VH	H	L	H	H
8.2 Problematic Native Plants & Animals	H	M	-	H	M
8.3 Introduced Genetic Material	M	-	Unknown	-	Unknown

Level II Threats – Birds	Grassland	Shrubland	Rowcrop	Woodland	Wetland
8.4 Pathogens & Microbes	Unknown	Unknown	Unknown	H	L
9.1 Household Sewage & Urban Waste Water	L	L	-	L	L
9.2 Industrial & Military Effluents	L	-	-	L	L
9.3 Agricultural & Forestry Effluents	L	L	L	L	VH
9.4 Garbage & Solid Waste	L	-	-	L	Unknown
9.5 Air-borne Pollutants	H	M	L	L	-
9.6 Excess Energy	Not a Threat	-	-	-	-
10.1 Volcanoes	-	-	-	-	-
10.2 Earthquakes/tsunamis	-	-	-	-	-
10.3 Avalanches/mudslides	-	-	-	-	-
11.1 Ecosystem Encroachment	Not a threat within the next 10 years	Not a threat within the next 10 years	Not a threat within the next 10 years	Not a threat within the next 10 years	Not a threat within the next 10 years
11.2 Changes in Geochemical Regimes	Unknown	Unknown	Unknown	Unknown	Unknown
11.3 Changes in Temperature Regimes	M	M	H-L	M	H
11.4 Changes in Precipitation & Broad-scale Hydrological Regimes	H	H	H-L	H	H
11.5 Severe/extreme Weather Events	H	M	H-L	M	H

Appendix 21- 4. Level II Threats to Butterflies

Impact level: L = Low, M = Medium, H = High, VH = Very High (Negligible threats demarked with a dash)

Level II Threats – Butterflies	Grassland	Rowcrop	Wetland	Woodland
1.1 Housing & Urban Areas	M	-	L	L
1.2 Commercial & Industrial Areas	L	L	L	-
1.3 Tourism & Recreation Areas	L	Not a Threat	-	L
2.1 Annual & Perennial Non-Timber Crops	VH	NA	H	M
2.2 Wood & Pulp Plantations	-	Not a Threat	-	-
2.3 Livestock Farming & Ranching	M-L	Not a Threat	M-L	L
2.4 Marine & Freshwater Aquaculture	-	-	-	-
3.1 Oil & Gas Drilling	-	-	-	-
3.2 Mining & Quarrying	L	-	L	L
3.3 Renewable Energy	M-L	Not a Threat	L	L
4.1 Roads & Railroads	L	Not a Threat	L	L
4.2 Utility & Service Lines	L	L	L	Not a Threat

Level II Threats – Butterflies	Grassland	Rowcrop	Wetland	Woodland
4.3 Shipping Lanes	-	-	-	-
4.4 Flight Paths	-	-	-	-
5.1 Hunting & Collecting Terrestrial Animals	L	-	-	-
5.2 Gathering Terrestrial Plants	-	-	-	L
5.3 Logging & Wood Harvesting	-	-	-	M
5.4 Fishing & Harvesting Aquatic Resources	-	-	-	-
6.1 Recreational Activities	L	-	L	-
6.2 War, Civil Unrest & Military Exercises	-	-	-	-
6.3 Work & Other Activities	M	M	-	-
7.1 Fire & Fire Suppression	VH-M	-	L	L
7.2 Dams & Water Management/Use	-	L	H	-
7.3 Other Ecosystem Modifications	M	-	L	L
7.4 Removing/Reducing Human Maintenance	M	Not a Threat	L	M
8.1 Invasive Non-native Alien Plants & Animals	M	Not a Threat	H	L
8.2 Problematic Native Plants & Animals	M	Not a Threat	M	L
8.3 Introduced Genetic Material	L	Unknown	Unknown	-
8.4 Pathogens & Microbes	L	Unknown	L	M-L
9.1 Household Sewage & Urban Waste Water	-	-	L	-
9.2 Industrial & Military Effluents	-	-	L	-
9.3 Agricultural & Forestry Effluents	L	-	M	L
9.4 Garbage & Solid Waste	-	-	-	-
9.5 Air-borne Pollutants	H	M-L	-	L
9.6 Excess Energy	-	-	-	-
10.1 Volcanoes	-	-	-	-
10.2 Earthquakes/tsunamis	-	-	-	-
10.3 Avalanches/mudslides	-	-	-	-
11.1 Ecosystem Encroachment	Not a threat within next 10 years	-	Not a threat within next 10 years	L
11.2 Changes in Geochemical Regimes	Unknown	Unknown	Unknown	-
11.3 Changes in Temperature Regimes	M	M	M	M
11.4 Changes in Precipitation & Broad-scale Hydrological Regimes	H-M	H	H	M-L
11.5 Severe/extreme Weather Events	L	L	L	L

Appendix 21- 5. Level II Threats to Crayfish

Impact level: L = Low, M = Medium, H = High, VH = Very High (Negligible threats demarked with a dash)

Level II Threats – Crayfish	All Aquatic Habitat Types
1.1 Housing & Urban Areas	M
1.2 Commercial & Industrial Areas	M
1.3 Tourism & Recreation Areas	-
2.1 Annual & Perennial Non-Timber Crops	M
2.2 Wood & Pulp Plantations	-
2.3 Livestock Farming & Ranching	M
2.4 Marine & Freshwater Aquaculture	L
3.1 Oil & Gas Drilling	-
3.2 Mining & Quarrying	L
3.3 Renewable Energy	L
4.1 Roads & Railroads	L
4.2 Utility & Service Lines	L
4.3 Shipping Lanes	L
4.4 Flight Paths	-
5.1 Hunting & Collecting Terrestrial Animals	-
5.2 Gathering Terrestrial Plants	-
5.3 Logging & Wood Harvesting	L
5.4 Fishing & Harvesting Aquatic Resources	L
6.1 Recreational Activities	-
6.2 War, Civil Unrest & Military Exercises	-
6.3 Work & Other Activities	-
7.1 Fire & Fire Suppression	-
7.2 Dams & Water Management/Use	VH
7.3 Other Ecosystem Modifications	M
7.4 Removing/Reducing Human Maintenance	-
8.1 Invasive Non-native Alien Plants & Animals	H
8.2 Problematic Native Plants & Animals	L
8.3 Introduced Genetic Material	Unknown
8.4 Pathogens & Microbes	Unknown
9.1 Household Sewage & Urban Waste Water	L
9.2 Industrial & Military Effluents	L
9.3 Agricultural & Forestry Effluents	H
9.4 Garbage & Solid Waste	L
9.5 Air-borne Pollutants	L
9.6 Excess Energy	L
10.1 Volcanoes	-

Level II Threats – Crayfish	All Aquatic Habitat Types
10.2 Earthquakes/tsunamis	-
10.3 Avalanches/mudslides	-
11.1 Ecosystem Encroachment	Not a threat within the next 10 years
11.2 Changes in Geochemical Regimes	Unknown
11.3 Changes in Temperature Regimes	M
11.4 Changes in Precipitation & Broad-scale Hydrological Regimes	H-M
11.5 Severe/extreme Weather Events	L

Appendix 21- 6. Level II Threats to Dragonflies and Damselflies

Impact level: L = Low, M = Medium, H = High, VH = Very High (Negligible threats demarked with a dash)

Level II Threats – Dragonflies & Damselflies	Grassland	Rivers	Rowcrop	Wetland	Woodland
1.1 Housing & Urban Areas	M	L	-	L	L
1.2 Commercial & Industrial Areas	L	L	-	L	-
1.3 Tourism & Recreation Areas	L	L	Not a Threat	-	L
2.1 Annual & Perennial Non-Timber Crops	VH	-	NA	VH	H
2.2 Wood & Pulp Plantations	-	-	-	-	-
2.3 Livestock Farming & Ranching	L	L	Not a Threat	L	L
2.4 Marine & Freshwater Aquaculture	-	L	-	-	-
3.1 Oil & Gas Drilling	-	-	-	-	-
3.2 Mining & Quarrying	L	L	Not a Threat	L	L
3.3 Renewable Energy	L	L	-	-	L
4.1 Roads & Railroads	L	L	Not a Threat	M	-
4.2 Utility & Service Lines	-	-	-	L	-
4.3 Shipping Lanes	-	-	-	-	-
4.4 Flight Paths	-	-	-	L	-
5.1 Hunting & Collecting Terrestrial Animals	-	-	-	-	-
5.2 Gathering Terrestrial Plants	-	-	-	-	-
5.3 Logging & Wood Harvesting	-	-	-	-	L
5.4 Fishing & Harvesting Aquatic Resources	-	-	-	-	-
6.1 Recreational Activities	-	-	-	-	-
6.2 War, Civil Unrest & Military Exercises	-	-	-	-	-

Level II Threats – Dragonflies & Damselflies	Grassland	Rivers	Rowcrop	Wetland	Woodland
6.3 Work & Other Activities	L	-	L	-	-
7.1 Fire & Fire Suppression	M	-	-	L	-
7.2 Dams & Water Management/Use	-	H	VH	VH	-
7.3 Other Ecosystem Modifications	-	-	-	-	-
7.4 Removing/Reducing Human Maintenance	L	-	Not a Threat	-	-
8.1 Invasive Non-native Alien Plants & Animals	Unknown	Unknown	Unknown	Unknown	Unknown
8.2 Problematic Native Plants & Animals	-	-	-	L	-
8.3 Introduced Genetic Material	Unknown	Unknown	Unknown	Unknown	Unknown
8.4 Pathogens & Microbes	-	-	-	Unknown	-
9.1 Household Sewage & Urban Waste Water	-	L	-	L	-
9.2 Industrial & Military Effluents	-	M	-	L	-
9.3 Agricultural & Forestry Effluents	-	VH	-	H	-
9.4 Garbage & Solid Waste	-	-	-	-	-
9.5 Air-borne Pollutants	L	-	L	-	-
9.6 Excess Energy	-	-	-	-	-
10.1 Volcanoes	-	-	-	-	-
10.2 Earthquakes/tsunamis	-	-	-	-	-
10.3 Avalanches/mudslides	-	-	-	-	-
11.1 Ecosystem Encroachment	-	-	-	-	-
11.2 Changes in Geochemical Regimes	Unknown	Unknown	Unknown	Unknown	Unknown
11.3 Changes in Temperature Regimes	M	M	M	M	M
11.4 Changes in Precipitation & Broad-scale Hydrological Regimes	H	H	H	H	H
11.5 Severe/extreme Weather Events	L	L	L	L	L

Appendix 21- 7. Level II Threats to Fish

Impact level: L = Low, M = Medium, H = High, VH = Very High (Negligible threats demarked with a dash)

Level II Threats – Fish	All Aquatic Habitat Types
1.1 Housing & Urban Areas	H
1.2 Commercial & Industrial Areas	M
1.3 Tourism & Recreation Areas	-
2.1 Annual & Perennial Non-Timber Crops	M
2.2 Wood & Pulp Plantations	-
2.3 Livestock Farming & Ranching	H
2.4 Marine & Freshwater Aquaculture	M
3.1 Oil & Gas Drilling	-
3.2 Mining & Quarrying	M
3.3 Renewable Energy	M
4.1 Roads & Railroads	L
4.2 Utility & Service Lines	L
4.3 Shipping Lanes	L
4.4 Flight Paths	-
5.1 Hunting & Collecting Terrestrial Animals	-
5.2 Gathering Terrestrial Plants	-
5.3 Logging & Wood Harvesting	L
5.4 Fishing & Harvesting Aquatic Resources	L
6.1 Recreational Activities	-
6.2 War, Civil Unrest & Military Exercises	-
6.3 Work & Other Activities	-
7.1 Fire & Fire Suppression	-
7.2 Dams & Water Management/Use	VH
7.3 Other Ecosystem Modifications	M
7.4 Removing/Reducing Human Maintenance	-
8.1 Invasive Non-native Alien Plants & Animals	H
8.2 Problematic Native Plants & Animals	L
8.3 Introduced Genetic Material	Unknown
8.4 Pathogens & Microbes	L
9.1 Household Sewage & Urban Waste Water	L
9.2 Industrial & Military Effluents	L
9.3 Agricultural & Forestry Effluents	H
9.4 Garbage & Solid Waste	L
9.5 Air-borne Pollutants	L
9.6 Excess Energy	L
10.1 Volcanoes	-

10.2 Earthquakes/tsunamis	-
10.3 Avalanches/mudslides	-
11.1 Ecosystem Encroachment	Not a significant impact within next 10 years
11.2 Changes in Geochemical Regimes	Unknown
11.3 Changes in Temperature Regimes	H
11.4 Changes in Precipitation & Broad-scale Hydrological Regimes	M
11.5 Severe/extreme Weather Events	L

Appendix 21- 8. Level II Threats to Mammals

Impact level: L = Low, M = Medium, H = High, VH = Very High (Negligible threats demarked with a dash)

Level II Threats – Mammals	Grassland	Rivers	Rowcrop	Wetland	Woodland
1.1 Housing & Urban Areas	L	L	L	L	M
1.2 Commercial & Industrial Areas	L	L	L	L	-
1.3 Tourism & Recreation Areas	L	-	-	Not a Threat	M-L
2.1 Annual & Perennial Non-Timber Crops	VH	VH	NA	VH	H
2.2 Wood & Pulp Plantations	-	-	-	-	-
2.3 Livestock Farming & Ranching	M	H	Not a Threat	M	M
2.4 Marine & Freshwater Aquaculture	-	-	-	-	-
3.1 Oil & Gas Drilling	-	-	-	-	-
3.2 Mining & Quarrying	L	-	-	-	L
3.3 Renewable Energy	L	-	L	L	L
4.1 Roads & Railroads	M	L	L	M	M
4.2 Utility & Service Lines	Not a Threat	L	L	L	L
4.3 Shipping Lanes	-	L	-	L	-
4.4 Flight Paths	-	-	-	-	-
5.1 Hunting & Collecting Terrestrial Animals	L	-	-	-	Not a Threat
5.2 Gathering Terrestrial Plants	-	-	-	-	-
5.3 Logging & Wood Harvesting	-	-	-	-	H-L
5.4 Fishing & Harvesting Aquatic Resources	-	-	-	-	-
6.1 Recreational Activities	L	-	L	-	M
6.2 War, Civil Unrest & Military Exercises	-	-	-	-	-
6.3 Work & Other Activities	M	-	M	-	-
7.1 Fire & Fire Suppression	M	-	-	L	M

Level II Threats – Mammals	Grassland	Rivers	Rowcrop	Wetland	Woodland
7.2 Dams & Water Management/Use	-	H	L	VH	L
7.3 Other Ecosystem Modifications	H	L	-	L	L
7.4 Removing/Reducing Human Maintenance	H	Not a Threat	Not a Threat	M-L	M
8.1 Invasive Non-native Alien Plants & Animals	H	L	M	L	L
8.2 Problematic Native Plants & Animals	M	-	-	L	L
8.3 Introduced Genetic Material	Unknown	Unknown	Unknown	Unknown	Unknown
8.4 Pathogens & Microbes	L	Unknown	Unknown	Unknown	M
9.1 Household Sewage & Urban Waste Water	L	M-L	-	L	L
9.2 Industrial & Military Effluents	L	L	-	L	L
9.3 Agricultural & Forestry Effluents	L	H	L	H	L
9.4 Garbage & Solid Waste	L	-	L	-	L
9.5 Air-borne Pollutants	L	-	L	-	-
9.6 Excess Energy	-	-	-	-	-
10.1 Volcanoes	-	-	-	-	-
10.2 Earthquakes/tsunamis	-	-	-	-	-
10.3 Avalanches/mudslides	-	-	-	-	-
11.1 Ecosystem Encroachment	Not a threat within next 10 years	Not a threat within next 10 years	Not a threat within next 10 years	Not a threat within next 10 years	Not a threat within next 10 years
11.2 Changes in Geochemical Regimes	Unknown	L	Unknown	-	Not a threat within next 10 years
11.3 Changes in Temperature Regimes	-	-	-	-	Not a threat within next 10 years
11.4 Changes in Precipitation & Broad-scale Hydrological Regimes	M	H	L	H	Not a threat within next 10 years
11.5 Severe/extreme Weather Events	L	H	L	M	Not a threat within next 10 years

Appendix 21- 9. Level II Threats to Mussels

Impact level: L = Low, M = Medium, H = High, VH = Very High (Negligible threats demarked with a dash)

Level II Threats – Mussels	All Aquatic Habitat Types
1.1 Housing & Urban Areas	M
1.2 Commercial & Industrial Areas	L
1.3 Tourism & Recreation Areas	M
2.1 Annual & Perennial Non-Timber Crops	VH
2.2 Wood & Pulp Plantations	-
2.3 Livestock Farming & Ranching	VH
2.4 Marine & Freshwater Aquaculture	L
3.1 Oil & Gas Drilling	-
3.2 Mining & Quarrying	L
3.3 Renewable Energy	L
4.1 Roads & Railroads	H
4.2 Utility & Service Lines	M
4.3 Shipping Lanes	L
4.4 Flight Paths	-
5.1 Hunting & Collecting Terrestrial Animals	-
5.2 Gathering Terrestrial Plants	-
5.3 Logging & Wood Harvesting	L
5.4 Fishing & Harvesting Aquatic Resources	H
6.1 Recreational Activities	M
6.2 War, Civil Unrest & Military Exercises	-
6.3 Work & Other Activities	-
7.1 Fire & Fire Suppression	L
7.2 Dams & Water Management/Use	VH
7.3 Other Ecosystem Modifications	L
7.4 Removing/Reducing Human Maintenance	-
8.1 Invasive Non-native Alien Plants & Animals	M
8.2 Problematic Native Plants & Animals	-
8.3 Introduced Genetic Material	-
8.4 Pathogens & Microbes	-
9.1 Household Sewage & Urban Waste Water	H
9.2 Industrial & Military Effluents	H
9.3 Agricultural & Forestry Effluents	VH
9.4 Garbage & Solid Waste	L
9.5 Air-borne Pollutants	-
9.6 Excess Energy	M
10.1 Volcanoes	-

Level II Threats – Mussels	All Aquatic Habitat Types
10.2 Earthquakes/tsunamis	-
10.3 Avalanches/mudslides	-
11.1 Ecosystem Encroachment	Unknown
11.2 Changes in Geochemical Regimes	L
11.3 Changes in Temperature Regimes	H
11.4 Changes in Precipitation & Broad-scale Hydrological Regimes	VH
11.5 Severe/extreme Weather Events	VH

Appendix 21- 10. Level II Threats to Terrestrial Snails

Impact level: L = Low, M = Medium, H = High, VH = Very High (Negligible threats demarked with a dash)

Level II Threats to Terrestrial Snails	Driftless Area Forest
1.1 Housing & Urban Areas	M
1.2 Commercial & Industrial Areas	-
1.3 Tourism & Recreation Areas	L
2.1 Annual & Perennial Non-Timber Crops	M
2.2 Wood & Pulp Plantations	-
2.3 Livestock Farming & Ranching	L
2.4 Marine & Freshwater Aquaculture	-
3.1 Oil & Gas Drilling	-
3.2 Mining & Quarrying	L
3.3 Renewable Energy	L
4.1 Roads & Railroads	M
4.2 Utility & Service Lines	L
4.3 Shipping Lanes	-
4.4 Flight Paths	-
5.1 Hunting & Collecting Terrestrial Animals	-
5.2 Gathering Terrestrial Plants	-
5.3 Logging & Wood Harvesting	H
5.4 Fishing & Harvesting Aquatic Resources	-
6.1 Recreational Activities	L
6.2 War, Civil Unrest & Military Exercises	-
6.3 Work & Other Activities	-
7.1 Fire & Fire Suppression	M
7.2 Dams & Water Management/Use	L
7.3 Other Ecosystem Modifications	M
7.4 Removing/Reducing Human Maintenance	L

8.1 Invasive Non-native Alien Plants & Animals	M
8.2 Problematic Native Plants & Animals	M
8.3 Introduced Genetic Material	-
8.4 Pathogens & Microbes	L
9.1 Household Sewage & Urban Waste Water	L
9.2 Industrial & Military Effluents	L
9.3 Agricultural & Forestry Effluents	L
9.4 Garbage & Solid Waste	-
9.5 Air-borne Pollutants	L
9.6 Excess Energy	-
10.1 Volcanoes	-
10.2 Earthquakes/tsunamis	-
10.3 Avalanches/mudslides	-
11.1 Ecosystem Encroachment	Not a threat within next 10 years
11.2 Changes in Geochemical Regimes	Unknown
11.3 Changes in Temperature Regimes	H
11.4 Changes in Precipitation & Broad-scale Hydrological Regimes	H-M
11.5 Severe/extreme Weather Events	H

Appendix 21. Climate Change Vulnerability Report for Species of Conservation Concern in Iowa

This assessment was conducted from 2009-2011. The SGCN included were those designated at that time and differ from the SGCN in the 2015 revision.



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Abstract

Climate change is currently affecting wildlife populations across the globe and will increasingly become an important concern for wildlife managers. The Iowa Department of Natural Resources worked in collaboration with wildlife experts from across the state to create this climate change vulnerability assessment of species of interest and species of conservation need in Iowa. NatureServe's Climate Change Vulnerability Index tool was used, along with species specific assessments and predictions of Iowa's future climate, in order to produce information about the degree to which each species may be affected by climate change by the end of the 21st century. The results show that about 44% of the Iowa species assessed will be vulnerable to climate change. The purpose of this assessment is to help inform management efforts and identify wildlife populations that may be of conservation need in the future. Managers should use the results of this assessment, as well as continued monitoring, to design and implement effective conservation practices as climate change continues to affect Iowa's landscape.

Explanation and Purpose of Assessment

Climate change is transforming ecosystems across the Earth and affecting wildlife populations adapted to current climatic characteristics that are rapidly becoming a part of the past (Parmesan and Yohe 2003). Many of the climate changes being seen have occurred within the last 50 years. These changes are predicted to continue and likely increase (Glick et al., 2011). Heavy rain and extended drought are becoming more extreme and more common (Glick et al., 2011). Seasonal changes in temperature are affecting the timing of plant and animal life cycle events such as blooming, migration, and breeding. These changes in phenology have a cascade effect that can decouple important ecological symbioses that are essential for the survival of many species.

The Iowa Climate Change Impacts Committee prepared a report in 2011 highlighting data showing the changes that have already occurred in Iowa over the last 50 years and predicted that these changes would continue into the future (Mutel 2011). Nightly low temperatures and daily high temperatures in the winter have increased. However, the daily maximum temperatures in summer have decreased. Precipitation patterns have shifted towards wetter springs and drier autumns and humidity levels in Iowa have also increased (Mutel 2011). Higher humidity levels augment the amount of moisture in the atmosphere which can increase the occurrence and severity of storms. The model used by the Iowa Climate Change Impacts Committee shows that there will be a 21% increase in precipitation by 2040. They point out that this could lead to a 50% increase in streamflow in the Upper Mississippi River basin, indicating that the potential for flooding will also increase. Earlier and quicker snow melt will also contribute to increased streamflow, runoff, and flooding.

Changes in climate will impact wildlife in different ways. Habitat loss and change can increase the spread of non-native species and cause the decline of native species that may no longer be able to survive where they have adapted to live. Stream temperatures are predicted to increase, which will affect species that are dependent on cold water. Higher temperatures may further shift the timing of life cycle events like migration, hibernation, breeding, and flowering. Changes in species life cycle events can increase the occurrence of disease and can decouple important

species interactions. These impacts are already being seen in the Midwest and across the globe. Habitat fragmentation and loss is a challenge that wildlife already faces, and this will exacerbate the effects of climate change. The complex effects of climate change and varying degree to which climate change will affect different species makes the challenges associated with this phenomenon a complicated conservation management issue.

In response to the environmental impacts of climate change, managers are going to have to adapt their practices as the threats facing wildlife populations shift with the climate. The current challenges wildlife populations face may intensify the effects of climate change, making threatened species more vulnerable. Conversely, species that were once common may become less common.

The climate assessment detailed in this document builds on research that was done to identify species of greatest conservation need for the Iowa Wildlife Action Plan, which was drafted to help managers keep common species common and understand what species are of conservation need. This assessment identifies species which may be vulnerable to climate change in order to improve and inform management strategies that will have to address any increased vulnerability of species and habitats.

Methodology

The Iowa Climate Change Vulnerability Assessment predicted climate vulnerability for 330 species in the state. Iowa's Species of Greatest Conservation Need (SGCN), as determined by the Iowa Wildlife Action Plan, were included, as well as several non-SGCN species that are associated with key habitats.

NatureServe's Climate Change Vulnerability Index tool (CCVI), which is available for free download at <https://connect.natureserve.org/science/climate-change>, was used to complete this assessment. This method was chosen because of its low cost and its relatively rapid means of assessing a large number of species. The predicted climate changes used in the assessment were derived from www.climatewizard.org, which produces climate change predictions on geographical temperature and precipitation shifts. These predictions are based on various user-chosen settings. For this assessment a medium emission scenario was selected and multiple General Circulation Models were averaged to predict climatic conditions at the end of the 21st century in Iowa.

NatureServe's Climate Change Vulnerability Index tool combines information about predicted climatic conditions with information from individual species assessments to determine the potential degree to which each species will be affected by climate change. The Iowa Wildlife Action Plan Implementation Committee has a Wildlife Working Group, which oversees a group of taxonomic subcommittees, one for each taxon covered by the Action Plan. Members of these taxonomic subcommittees, which are populated by experts in the relevant taxa, collaborated to complete the species assessments. The CCVI tool considers species exposure and species sensitivity in order to make a prediction about the possible effects climate change will have on a population. Species exposure covers the degree to which temperature and precipitation is predicted to change across the species' range. Species sensitivity includes species characteristics such as diet, habitat preferences, genetic variation within the population, and dispersal abilities which are indicators of how resilient or adaptable a population may be to the effects of climate change.

This project did not evaluate the vulnerability of species to all potential threats. It is solely focused on vulnerability to *climate* change. The species assessments identify factors that make a species vulnerable specifically to climate change, separate from any unrelated threats that the species may currently be facing. Is it important to identify how a species will specifically be vulnerable to climate change independently of current environmental challenges because current environmental issues may change with the climate, making it possible that species that are currently

of conservation need may benefit from climate change. Conversely, species that are not of conservation concern today may decline in the future if they are particularly susceptible to the environmental effects of climate change.

General Findings

Out of the 335 Iowa species that were assessed, 151 species, or about 45%, were predicted to be vulnerable to climate change (Table Appendix 21- 1). About 33% of the species assessed were presumed stable and about 22% were predicted to have population increases (Table Appendix 21- 1). Overall, the mollusks, amphibians, and reptiles appeared to be the most vulnerable taxa. The mollusks had the highest number of extremely vulnerable species (38 species or 95%) and did not have any species that were predicted to increase (Figure Appendix 21- 1). Amphibians and reptiles also did not include any species that were predicted to increase. One amphibian species was presumed stable and the reptiles had two presumed stable species (Figure Appendix 21- 1). The breeding birds had the highest percent (61%) of species with populations that were predicted to increase (Figure Appendix 21- 1). Only seven of the breeding birds were predicted to be vulnerable to climate change (Table Appendix 21- 1). In reality, a higher percentage of the birds assessed will likely be vulnerable to climate change due to the threats they face outside of Iowa during different parts of their life cycle. The mammals, fish, and odonates had the majority of their species fall into either the presumed stable or likely to increase categories. Out of these three taxa the fish had the highest number of vulnerable species (Fish = 29, Mammals = 9, Odonates = 12).

Table Appendix 21- 1. Number of species in each index category by taxonomic group

	Amphibians	Reptiles	Breeding Birds	Fish	Mammals	Mollusks	Butterflies	Odonates	Total
Extremely Vulnerable	5	8	1	3	2	38	10	5	72
Highly Vulnerable	1	6	0	4	3	0	4	3	21
Moderately Vulnerable	2	7	6	22	4	1	12	4	58
Presumed Stable	1	2	28	37	10	1	18	13	110
Increase Likely	0	0	54	8	7	0	2	3	74
Total	9	23	89	74	26	40	46	28	

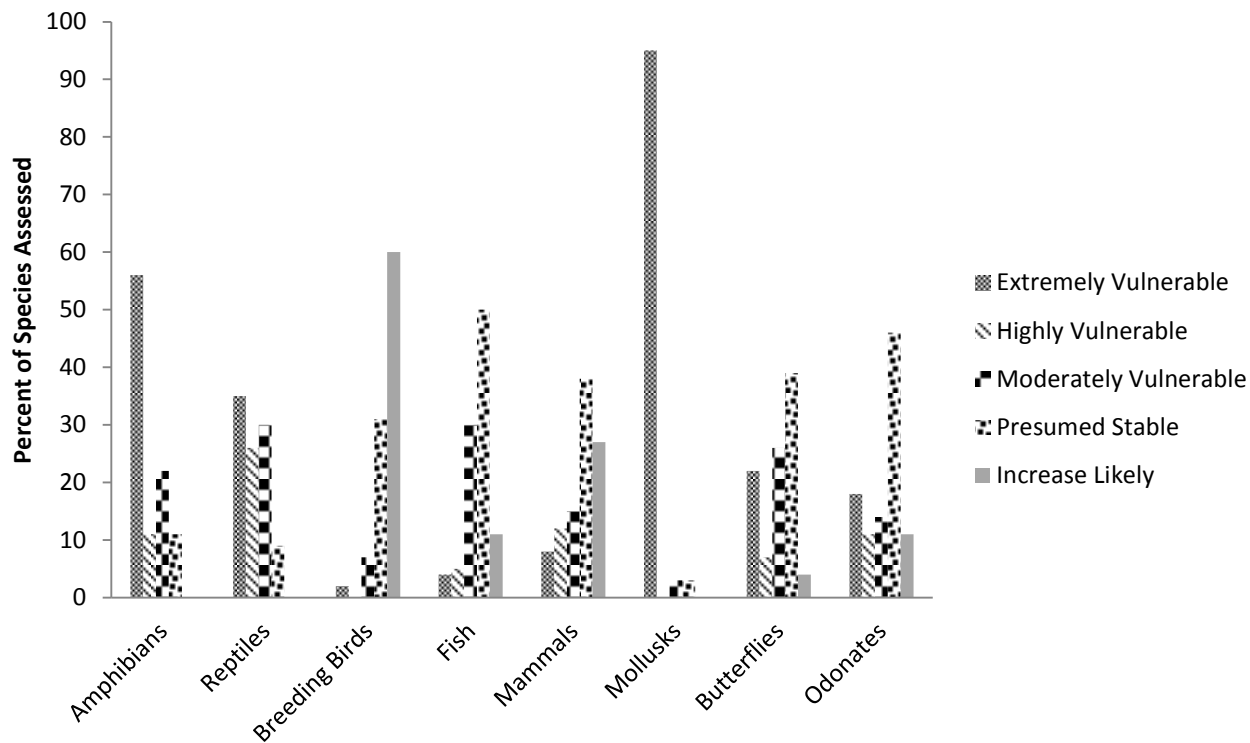


Figure Appendix 21- 1. The percent of species per taxon in each vulnerability index category

Results by Taxonomic Group:

Amphibians

The amphibian taxon was predicted to be very vulnerable to climate change. In this assessment the amphibian and one non-SGCN species were considered. All of the nine species assessed, except the Plains Spadefoot, are predicted to be vulnerable to climate change, and two-thirds were predicted to be extremely or highly vulnerable (

Table Appendix 21- 2). This assessment predicted that, in response to climate change, two of the amphibian species, the Smallmouth Salamander (*Ambystoma laterale*) and the Crawfish Frog (*Lithobates areolata*), may expand their current ranges. Crawfish Frogs haven't been documented in Iowa since the 1940's, so any occurrence in Iowa would represent a re-expansion into formerly inhabited range. Although amphibians are generally fairly mobile, they cannot travel extremely long distances and may face barriers to movement, such as roads and other anthropogenic and natural features on the landscape. These barriers could prevent them from escaping the effects of climate change by traveling to a suitable niche in a new location. Dispersal and range shifts may also put species into areas with new predators and different prey availability. Species that have specific habitat and temperature requirements may also have difficulty finding a new location that fits their needs. Changes in temperature are also associated with susceptibility to disease and can change breeding times in this taxon (Kingsbury and Gibson 2012).

Table Appendix 21- 2. Climate change vulnerability of amphibians assessed in Iowa

Species names in bold are either federally or state listed as threatened or endangered. See appendix 14 for NatureServe's state rank definitions and appendix 15 for specific threatened and endangered species listings. Common names with an asterisk (*) were non-SGCM species during time of assessment (2009-2011).

	Species	State Rank	Associated Habitat	Index Score
1	Cricket Frog (<i>Acris crepitans</i>)	S3?	Shallow wetlands/streams	Extremely Vulnerable
2	Blue-spotted Salamander (<i>Ambystoma laterale</i>)	S1	Woodland pools/open woods	Extremely Vulnerable
3	Smallmouth Salamander (<i>Ambystoma texanum</i>)	S3	Woodland pools/open woods	Extremely Vulnerable
4	Mudpuppy (<i>Necturus maculosus</i>)	S2	Clean rivers, streams, lakes, and reservoirs	Extremely Vulnerable
5	Central Newt (<i>Notophthalmus viridescens</i>)	SNR	Vegetated woodland ponds, roadside flooded ditches and adjacent habitat	Extremely Vulnerable
6	*Eastern Tiger Salamander (<i>Ambystoma tigrinum</i>)	S5	Habitat generalist	Highly Vulnerable
7	Great Plains Toad (<i>Anaxyrus cognatus</i>)	S4	Prairie/nonnative grassland	Moderately Vulnerable
8	Crawfish Frog (<i>Lithobates areolata</i>)	S1	Prairie marshes, ponds and river floodplains	Moderately Vulnerable
9	Plains Spadefoot (<i>Spea bombifrons</i>)	S4	Loess Hills	Presumed Stable

Reptiles

All reptile species of greatest conservation need and one non-SGCM species were assessed. Only two of the 23 reptile species assessed were predicted to maintain stable populations and no species were predicted to increase, leaving 21 reptile species that are predicted to be vulnerable to climate change (Table Appendix 21- 3). Reptiles face many of the same adaptation challenges as amphibians. Anthropogenic and natural barriers can inhibit dispersal of reptile species into a habitat with preferred characteristics. Temperature and habitat requirements also limit the number of areas reptiles will be able to move into. As with any species, reptiles with a more generalized diet and less specific habitat requirements may have a better response to the predicted changes in climate. Changes in temperature have also been linked to shifts in sex ratios because incubation temperature affects sex determination in some reptile species (Mitchell and Janzen 2010). This could affect the success of reproduction and thus influence the persistence of a species.

Table Appendix 21- 3. Climate change vulnerability of reptiles assessed in Iowa

Species names in bold are either federally or state listed as threatened or endangered. See appendix 14 for NatureServe's state rank definitions and appendix 15 for specific threatened and endangered species listings. Common names with an asterisk (*) were non-SGCM species during time of assessment (2009-2011).

	Species	State Rank	Habitat Preference	Index Score
1	Yellow Mud Turtle (<i>Kinosternon flavescens</i>)	S1	Shallow, ephemeral pools adjacent nearly pure sand soils	Extremely Vulnerable
2	Great Plains Skink (<i>Eumeces (Plestiodon) obsoletus</i>)	S1	Rocky/loess prairie and forest edge	Extremely Vulnerable
3	Copperbelly Water Snake (<i>Nerodia erythrogaster neglecta</i>)	S1	Backwater sloughs, forested wetland	Extremely Vulnerable

	Species	State Rank	Habitat Preference	Index Score
4	Massasauga (<i>Sistrurus catenatus</i>)	S1	Early successional wetland and upland grassland	Extremely Vulnerable
5	Prairie Rattlesnake (<i>Crotalus viridis</i>)	S1	Prairie	Extremely Vulnerable
6	Blanding's Turtle (<i>Emydoidea blandingii</i>)	S3	Shallow well-vegetated wetlands	Extremely Vulnerable
7	Common Musk Turtle (<i>Sternotherus odoratus</i>)	S2	Backwaters and spring fed ponds adjacent to sandy uplands	Extremely Vulnerable
8	Wood Turtle (<i>Glyptemys insculpta</i>)	S1	Floodplain forest, rivers	Extremely Vulnerable
9	Ornate Box Turtle (<i>Terrapene ornatus</i>)	S2	Sand/loess prairie, savanna	Highly Vulnerable
10	Slender Glass Lizard (<i>Ophisaurus attenuates</i>)	S1	Prairie, pastures, forest edge, savanna	Highly Vulnerable
11	Northern Prairie Skink (<i>Eumeces (Plestiodon) septentrionalis</i>)	S3	Sandy/loess prairie-forest edge, wetland edge	Highly Vulnerable
12	Smooth Green Snake (<i>Ophedryx (Liochlorophis) vernalis</i>)	S3	Old field, savanna, wet prairie and marsh	Highly Vulnerable
13	Timber Rattlesnake (<i>Crotalus horridus</i>)	S3	Forested areas near rock outcrops, woodland, hill prairie	Highly Vulnerable
14	Western Worm Snake (<i>Caphophis vermis</i>)	S2	Rocky wetlands	Highly Vulnerable
15	Six-lined Racerunner (<i>Aspidoscelis sexlineatus</i>)	S3	Sand/loess prairie, savanna	Moderately Vulnerable
16	Diamondback Water Snake (<i>Nerodia rhombifer</i>)	S2	Quiet pools and backwater sloughs	Moderately Vulnerable
17	Prairie Kingsnake (<i>Lampropeltis calligaster</i>)	S3	Woodland edge, open woodland, grassland, savanna	Moderately Vulnerable
18	Smooth Earth Snake (<i>Virginia valeriae</i>)	S3	Rocky woodland	Moderately Vulnerable
19	Bullsnake (<i>Pituophis catenifer sayi</i>)	S3	Prairie, deciduous woodland edge, savanna	Moderately Vulnerable
20	Western Hognose Snake (<i>Heterodon nasicus</i>)	S1	Sand/loess prairie	Moderately Vulnerable
21	Speckled Kingsnake (<i>Lampropeltis getula holbrooki</i>)	S1	Prairie, woodland edge, savanna	Moderately Vulnerable
22	Copperhead (<i>Agkistrodon contortrix</i>)	S1	Forested, rocky hillsides	Presumed Stable
23	*Five-lined Skink (<i>Plestiodon fasciatus</i>)	S4	Forest	Presumed Stable

Breeding Birds

Iowa's breeding bird Species of Greatest Conservation Need and 26 non-SGCN species were assessed. Only 7 of the breeding birds were predicted to be vulnerable to climate change in Iowa (Table Appendix 21- 4). Twenty-eight species were presumed stable and 54 were likely to increase. Twenty of Iowa's breeding birds are predicted to shift or expand their range and possibly leave the state.

Generally, the version of the CCVI used in Iowa's assessment considers birds to be less vulnerable to climate change because of their ability to travel long distances, and thus escape from the negative effects of climate change in their current habitats. However, mobility does not necessarily reduce a species' vulnerability to climate change. As with other species, when birds move into new regions they will face competition for resources with species that are already in that area and may experience new predation pressure. In addition, many of the birds that breed in Iowa only spend a portion of their life cycle here and often travel long distances to get to non-breeding and wintering habitat. This actually increases their vulnerability in many cases because they will face the effects of climate change, not only in Iowa but also in different regions of the United States, as well as in Mexico and Central and South America (Marra et al., 2014). Generally there is a drying trend predicted for the southeastern U.S., Mexico, and the Caribbean which is where many Iowa breeding birds spend the winter months. Amount of rainfall on wintering grounds is known to have an effect on timing of migration, body condition, and annual reproductive success for birds. If migration times shift too much, birds could arrive too early or too late to get the resources they need, such as insects or seeds and fruits that are only available in adequate amounts at certain times of the year. Birds have already been documented breeding earlier in the season (Townsend et al., 2013) and migrating earlier to breeding sites (Marra et al., 2008). These changes will only increase as the climate continues to change.

The complexity of full life cycle conservation for birds wasn't taken into account with the tool used for this assessment. This means that although the majority of Iowa's breeding birds were predicted to have stable or increasing populations under the predicted conditions in Iowa, they may face challenges in other parts of the world that, in turn, affect their status in Iowa. The Full Annual Cycle Climate Change Vulnerability Assessment conducted by Marra et al. (2014) assessed various full life cycle characteristics including migration distance, habitat and diet specialization at breeding and wintering grounds, and breeding site fidelity for 46 migratory birds of the Upper Midwest and Great Lakes region. These characteristics affect bird species adaptability to climate change, regardless of mobility, because if they are not able to find specific resources in the areas they inhabit they will be at risk. Often migratory birds have habitat and food requirements that are different in breeding and non-breeding areas which could create a situation where a species faces challenges in both places. Additionally, if a species returns to the same breeding site each year, it may not be likely to move to a new breeding location if conditions are not suitable.

Of the 46 birds assessed in the Full Annual Cycle Climate Change Vulnerability Assessment, nine were classified as highly vulnerable to climate change. This included four species that we assessed (highlighted in gray in Table Appendix 21- 4 below) which were not ranked as highly vulnerable to climate change. These species were the Black Tern, Forster's Tern, Whip-poor-will, and the Worm-eating Warbler. Our tool indicated that the two tern species were presumed to maintain stable populations, and the Worm-eating Warbler and Whip-poor-will were predicted to have increased populations. The Black Tern and Forster's Tern are heavily reliant on wetland habitat. Predicted temperature increases in Mexican and South American non-breeding habitats and predicted drying in the upper Midwest could mean these birds will face a doubled effect of climate change due to changes in each location that may be harmful. Additionally, the Forster's Tern relies on coldwater aquatic prey that could be at risk as temperatures increase. The Whip-poor-will was rated highly vulnerable in the Full Annual Cycle Climate Change Vulnerability Assessment because it has high breeding site fidelity and specialized diet and habitat needs. Information gaps about Whip-poor-will's non-breeding requirements prevented a more detailed prediction of why this species is highly vulnerable. Information gaps in our understanding of the full life cycle of various species could also mean that these species face threats of which we are not even yet aware. Finally, the Worm-eating Warbler was ranked highly vulnerable because of high breeding site fidelity and its specific preference for large, mature forest habitat. Habitat specificity is a general risk for most species. It is especially problematic for the Worm-eating Warbler

because large, mature forests are at high risk to climate change which is predicted to increase the occurrence of fires and predation by parasites.

Conservation efforts in Iowa that take into consideration the full life cycle of birds could require species' statuses to be updated to reflect all of the challenges a species faces, including those that occur outside the state. Within the state, it will be important to provide as much habitat diversity as possible in order to support numerous species. Establishing partnerships with entities outside of the state for conservation, monitoring, and research efforts will also be key for ensuring that birds which currently breed in Iowa will continue to breed and migrate through the state.

Table Appendix 21- 4. Climate change vulnerability of birds assessed in Iowa

Species names in bold are either federally or state listed as threatened or endangered. See appendix 14 for NatureServe's state rank definitions and appendix 15 for specific threatened and endangered species listings. Common names with an asterisk (*) were non-SGCN species during time of assessment (2009-2011). Species highlighted in gray were predicted to be highly vulnerable to climate change in The Full Annual Cycle Climate Change Vulnerability Assessment conducted by Marra et al (2014).

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
1	*Hooded Merganser (<i>Lophodytes cucullatus</i>)	S2	Backwater	Extremely Vulnerable	
2	Long-eared Owl (<i>Asio otus</i>)	S2	Open woodland, savanna, deciduous forest	Moderately Vulnerable	May shift range/leave
3	American Bittern (<i>Botaurus lentiginosus</i>)	S2	Herbaceous wetland	Moderately Vulnerable	
4	King Rail (<i>Rallus elegans</i>)	SNR	Herbaceous wetland	Moderately Vulnerable	May expand range
5	Brown Creeper (<i>Certhis Americana</i>)	S3	Deciduous and riparian forest	Moderately Vulnerable	May shift range
6	*Wood Duck (<i>Aix sponsa</i>)	S5	Backwater	Moderately Vulnerable	
7	*Ring-necked Pheasant (<i>Phasianus cochicus</i>)	SNR	Cool season grasses	Moderately Vulnerable	
8	Barn Owl (<i>Tyto alba</i>)	S1	Savanna	Presumed Stable	May expand range
9	Prothonotary Warbler (<i>Protonotaria citrea</i>)	S3	Riparian forest	Presumed Stable	May expand range
10	Swainson's Hawk (<i>Buteo swainsoni</i>)	S3	Savanna and open woodland	Presumed Stable	
11	Veery (<i>Catharus fuscescens</i>)	SNR	Riparian and deciduous forest	Presumed Stable	May shift range/leave
12	Bobolink (<i>Dolichonyx oryzivorus</i>)	S4	Warm season herbaceous grassland and agricultural land	Presumed Stable	
13	Greater Prairie-Chicken (<i>Tympanachus cupido</i>)	S1	Agricultural land and warm season herbaceous grassland	Presumed Stable	
14	Northern Bobwhite (<i>Colinus virginianus</i>)	S5	Warm season herbaceous grassland, shrubland, and agricultural land	Presumed Stable	May expand range
15	Black Tern (<i>Chlidonias niger</i>)	S1	Herbaceous wetland	Presumed Stable	

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
16	Black-crowned Night-heron (<i>Nycticorax nycticorax</i>)	S3	Herbaceous wetland and wet shrubland	Presumed Stable	
17	Common Gallinule(<i>Gallinula galeata</i>)	S2	Herbaceous Wetland	Presumed Stable	May expand range
18	Forster's Tern (<i>Sterna forsteri</i>)	S2	Herbaceous wetland	Presumed Stable	
19	Bell's Vireo (<i>Vireo bellii</i>)	S3	Shrubland and savanna	Presumed Stable	May expand range
20	Least Bittern (<i>Lxobrychus exilis</i>)	S3	Herbaceous Wetland	Presumed Stable	
21	Least Tern (<i>Sterna antillarum</i>)	S1	Herbaceous wetland	Presumed Stable	
22	Loggerhead Shrike (<i>Lanius ludovicianus</i>)	S3	Savanna and shrubland	Presumed Stable	
23	Sandhill Crane (<i>Grus canadensis</i>)	S1	Herbaceous wetland, Warm season herbaceous grassland, and agricultural land	Presumed Stable	May shift range/leave
24	Yellow-crowned Night-Heron (<i>Nyctanassa violacea</i>)	S3	Herbaceous wetland and riparian forest	Presumed Stable	May expand range
25	Ruffed Grouse (<i>Bonasa umbellus</i>)	S4	Dense forest and open woodland	Presumed Stable	
26	Eastern Meadowlark (<i>Sturnella magna</i>)	S4	Warm season herbaceous grassland, savanna, and agricultural land	Presumed Stable	
27	Field Sparrow (<i>Spizella pusilla</i>)	S5	Shrubland, Warm season herbaceous grassland, and agricultural land	Presumed Stable	
28	Grasshopper Sparrow (<i>Ammodramus savannarum</i>)	S4	Warm season herbaceous grassland and agricultural land	Presumed Stable	
29	Henslow's Sparrow (<i>Ammodramus henslowii</i>)	S3	Warm season herbaceous grassland and agricultural land	Presumed Stable	May expand range
30	Red-headed Woodpecker (<i>Melanerpe erythrocephalus</i>)	S5	Savanna, open woodland, and deciduous forest	Presumed Stable	
31	White-eyed Vireo (<i>Vireo griseus</i>)	S2	Open woodland and shrubland	Presumed Stable	May expand range
32	*Eastern Towhee (<i>Pipilo erythrophthalmus</i>)	S4	Shrubland	Presumed Stable	
33	*Pileated Woodpecker (<i>Dryocopus pileatus</i>)	S3	Forest	Presumed Stable	
34	*Northern Parula (<i>Parula americana</i>)	S3	Wet forest/woodland	Presumed Stable	
35	*American Redstart (<i>Setophaga ruticilla</i>)	S4	Wet forest/woodland	Presumed Stable	

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
36	Blue-winged Warbler (<i>Vermivora pinus</i>)	S3	Deciduous forest and shrubland	Increase Likely	
37	Cerulean Warbler (<i>Dendroica cerulean</i>)	S2	Deciduous forest	Increase Likely	
38	Hooded Warbler (<i>Wilsonia citrina</i>)	S1	Deciduous forest	Increase Likely	
39	Kentucky Warbler (<i>Oporornis formosus</i>)	S1	Deciduous and riparian forest	Increase Likely	May expand range
40	Louisiana Waterthrush (<i>Seiurus motacilla</i>)	S3	Deciduous and riparian forest	Increase Likely	
41	Osprey (<i>Pandion haliaetus</i>)	SNR	Herbaceous wetland and riparian forest	Increase Likely	
42	Peregrine Falcon (<i>Falco perigrinus</i>)	S1	Deciduous and riparian forest	Increase Likely	
43	Red-shouldered Hawk (<i>Buteo lineatus</i>)	S2	Riparian forest	Increase Likely	
44	Worm-eating Warbler (<i>Helmitheros vermivorus</i>)	S2	Deciduous forest	Increase Likely	May expand range
45	Wood Thrush (<i>Hylocichla mustelina</i>)	S4	Deciduous and riparian forest	Increase Likely	
46	Dickcissel (<i>Spiza americana</i>)	S4	Agricultural land and warm season herbaceous grassland	Increase Likely	
47	Sedge Wren (<i>Cistothorus platensis</i>)	S4	Warm season herbaceous grassland, herbaceous wetland, and agricultural land	Increase Likely	
48	American Woodcock (<i>Scolopax minor</i>)	S4	Deciduous forest, open wetland, and riparian forest	Increase Likely	
49	*Common Nighthawk (<i>Chordeiles minor</i>)	S5	Warm season herbaceous grassland, savanna, and agricultural land	Increase Likely	
50	Northern Harrier (<i>Circus cyaneus</i>)	S2	Warm season herbaceous grassland, marsh, and agricultural land	Increase Likely	
51	Piping Plover (<i>Charadrius melodus</i>)	S1	Herbaceous wetland	Increase Likely	
52	Short-eared Owl (<i>Asio flammeus</i>)	S1	Warm season herbaceous grassland and agricultural land	Increase Likely	
53	Upland Sandpiper (<i>Bartramia longicauda</i>)	S3	Warm season herbaceous grassland and agricultural land	Increase Likely	
54	Wilson's Phalarope (<i>Phalaropus tricolor</i>)	SNR	Herbaceous wetland, Warm season herbaceous grassland, and agricultural land	Increase Likely	
55	Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	S3	Deciduous forest, shrubland, and open woodland	Increase Likely	May expand range

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
56	Acadian Flycatcher (<i>Empidonax virescens</i>)	S3	Deciduous and riparian forest	Increase Likely	May expand range
57	Bald Eagle (<i>Haliaeetus leucodephala</i>)	S3	Deciduous and riparian forest	Increase Likely	
58	Black-and-white Warbler (<i>Mniotilta varia</i>)	SNR	Deciduous forest	Increase Likely	
59	Black-billed Cuckoo (<i>Coccyzus erythrophthalmus</i>)	S3	Deciduous and riparian forest open woodland, and shrubland	Increase Likely	
60	Broad-Winged Hawk (<i>Bueo platypterus</i>)	S3	Deciduous forest	Increase Likely	
61	Whip-poor-will (<i>Caprimulgus vociferous</i>)	S5	Deciduous forest and open woodland	Increase Likely	
62	Bewick's Wren (<i>Thryomanes bewickii</i>)	S2	Open woodland and shrubland	Increase Likely	May expand range
63	Willow Flycatcher (<i>Empidonax traillii</i>)	S4	Wet shrubland	Increase Likely	
64	Yellow-breasted Chat (<i>Icteria virens</i>)	S3	Open woodland/savanna and shrubland	Increase Likely	May expand range
65	Chimney Swift (<i>Chaetura pelagic</i>)	S5	Towns and cities	Increase Likely	
66	Least Flycatcher (<i>Empidonax minimus</i>)	S1	Deciduous forest and open woodland	Increase Likely	
67	Northern Mockingbird (<i>Mimus polyglottos</i>)	S3	Open woodland/savanna and shrubland	Increase Likely	
68	*Lark Sparrow (<i>Chondestes grammacus</i>)	S4	Grassland	Increase Likely	
69	Northern Pintail (<i>Anas acuta</i>)	S2	Herbaceous wetland, Warm season herbaceous grassland, and agricultural land	Increase Likely	
70	Canvasback (<i>Aythya valisineria</i>)	S2	Herbaceous wetland	Increase Likely	
71	Redhead (<i>Aythya americana</i>)	S2	Herbaceous wetland	Increase Likely	
72	Trumpeter Swan (<i>Cygnus buccinator</i>)	S2	Herbaceous wetland	Increase Likely	May shift range/leave
73	*Belted Kingfisher (<i>Megnaceryle alcyon</i>)	S4	River	Increase Likely	
74	*Northern Rough-winged Swallow (<i>Stelgidopteryx serripennis</i>)	S5	River	Increase Likely	
75	*Spotted Sandpiper (<i>Actitis macularius</i>)	S3	River	Increase Likely	
76	*Great Blue Heron (<i>Ardea Herodias</i>)	S3	Backwater	Increase Likely	
77	*Brown Thrasher (<i>Toxostoma rufum</i>)	S5	Shrubland	Increase Likely	
78	*Gray Catbird (<i>Dumetella caroliniensis</i>)	S5	Shrubland	Increase Likely	
79	*Indigo Bunting (<i>Passerina cyanea</i>)	S5	Woodland	Increase Likely	
80	*Northern Flicker (<i>Colaptes auratus</i>)	S5	Woodland	Increase Likely	

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
81	*Eastern Bluebird (<i>Contopus virens</i>)	S4	Savanna	Increase Likely	
82	*Eastern Wood-pewee (<i>Contopus virens</i>)	S4	Savanna	Increase Likely	
83	*American Kestrel (<i>Falco Sparverius</i>)	S5	Savanna	Increase Likely	
84	*Yellow Warbler (<i>Dendroica petechia</i>)	S4	Wet shrubland	Increase Likely	
85	*Common Yellowthroat (<i>Geothlypis trichas</i>)	S5	Wet shrubland	Increase Likely	
86	*Scarlet Tanager (<i>Piranga olivacea</i>)	S4	Forest	Increase Likely	
87	*Ovenbird (<i>Seiurus aurocapilla</i>)	S4	Forest	Increase Likely	
88	*Green Heron (<i>Butorides virescens</i>)	S3	Stream	Increase Likely	
89	*Warbling Vireo (<i>Vireo gilvus</i>)	S5	Wet forest/woodland	Increase Likely	

Fish

All of Iowa's fish species of greatest conservation need were assessed along with one non-SGCN species that is presumed to be extirpated. The presumed extirpated species (state rank SX) was included in order to understand if possible reintroduction is practical in Iowa in the context of climate change. Twenty-nine fish species or nearly 40% were predicted to be vulnerable to climate change (Table Appendix 21- 5). In general fish may have to deal with habitat destruction from an increased number of extreme weather events such as flooding or drought that are associated with climate change. Changes in water temperature may also affect some species. Twenty-six fish species are predicted to shift or expand their ranges or possibly leave the state. However, fish are limited to water bodies and therefore, face barriers to dispersal such as dams that may prevent a population for adjusting its range to a more suitable habitat.

Table Appendix 21- 5. Climate change vulnerability of fish assessed in Iowa

Species names in bold are either federally or state listed as threatened or endangered. See appendix 14 for NatureServe's state rank definitions and appendix 15 for specific threatened and endangered species listings. Common names with an asterisk (*) were non-SGCN species during time of assessment (2009-2011).

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
1	Crystal Darter (<i>Crystallaria asprella</i>)	S1	Small to medium fast flowing rivers with sand/gravel substrate	Extremely Vulnerable	May expand range
2	Ironcolor Shiner (<i>Notropis chalybaeus</i>)	SX	Slow flowing streams and river with sandy substrate	Extremely Vulnerable	May expand range
3	Paddlefish (<i>Polyodon spathula</i>)	S3	Medium to large rivers, backwaters, and impoundments with minimal flow	Extremely Vulnerable	
4	Topeka Shiner (<i>Notropis topeka</i>)	S2	Rivers, creeks, streams, and backwaters with minimal flow	Highly Vulnerable	
5	River Redhorse (<i>Moxostoma carinatum</i>)	SNR	Rivers and large creeks with clear water	Highly Vulnerable	

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
6	Trout-perch (<i>Percopsis omiscomaycus</i>)	S3	Streams and rivers with sandy substrate	Highly Vulnerable	
7	Western Sand Darter (<i>Ammocrypta clara</i>)	S2	Medium to large rivers with slow to moderate flow and sandy substrate	Highly Vulnerable	May expand range
8	Ozark Minnow (<i>Notropis nubilus</i>)	S3	Fast flowing creeks and medium to small rivers with rock/gravel substrate	Moderately Vulnerable	
9	Southern Redbelly Dace (<i>Phoxinus erythrogaster</i>)	S4	Small streams/creeks	Moderately Vulnerable	
10	Banded Killifish (<i>Fundulus diaphanous</i>)	S2?	Lakes, ponds, and streams with slow flows	Moderately Vulnerable	
11	Blackchin Shiner (<i>Notropis heterodon</i>)	SX	Lakes and streams with sand/gravel substrate	Moderately Vulnerable	
12	Bluntnose Darter (<i>Etheostoma chlorosoma</i>)	SX	Small to medium rivers, creeks, and backwaters with minimal slow and sandy/mucky substrate	Moderately Vulnerable	May expand range
13	Brook Trout (<i>Salvelinus fontinalis</i>)	S3	Cool creeks, streams, and small rivers with sand, gravel, cobble, or rocky substrate and moderate to fast water flow	Moderately Vulnerable	
14	Burbot (<i>Lota lota</i>)	S3	Deep, cold lakes and rivers	Moderately Vulnerable	May shift range/leave
15	Central Mudminnow (<i>Umbra limi</i>)	S3	Slow flowing, vegetated streams and backwaters	Moderately Vulnerable	
16	Redfin (Grass) Pickerel (<i>Esox americanus</i>)	S3	Ponds, backwaters, and small lakes with vegetated edges and minimal flows	Moderately Vulnerable	
17	Longnose Dace (<i>Rhinichthys cataractae</i>)	S3	Small to medium fast flowing rivers with clear water and rock/gravel substrate	Moderately Vulnerable	
18	Mud Darter (<i>Etheostoma asprigene</i>)	S3	Slow flowing rivers and backwaters with mucky/silty substrate	Moderately Vulnerable	May expand range
19	Orangethroat Darter (<i>Etheostoma spectabile</i>)	S2	Creeks and small rivers with fast to moderate flow; sand, cobble, bedrock, gravel substrate	Moderately Vulnerable	May expand range
20	Pirate Perch (<i>Aphredoderus sayanus</i>)	S3	Vegetated lakes, ponds, and backwater	Moderately Vulnerable	May expand range
21	Plains Minnow (<i>Hybognathus placitus</i>)	S4	Slow flowing rivers and streams with silty substrate	Moderately Vulnerable	
22	Spottail Shiner (<i>Notropis hudsonius</i>)	SNR	Lakes and large rivers with sandy/rocky substrate	Moderately Vulnerable	

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
23	Silver Lamprey (<i>Ichthyomyzon unicuspis</i>)	S3	Large rivers, impoundments, and lakes	Moderately Vulnerable	
24	Starhead Topminnow (<i>Fundulus dispar</i>)	SX	Creeks, backwaters, and oxbows with mucky substrate and no flow	Moderately Vulnerable	May expand range
25	Weed Shiner (<i>Notropis texanus</i>)	S2	Creeks and small to medium rivers with sandy substrate	Moderately Vulnerable	May expand range
26	Western Silvery Minnow (<i>Hybognathus argyritis</i>)	S1	Backwaters with silty/mucky substrate	Moderately Vulnerable	
27	Greater Redhorse (<i>Moxostoma valenciennesi</i>)	SNR	Medium to large rivers with moderate to fast flow and no silt	Moderately Vulnerable	
28	Silverband Shiner (<i>Notropis shumardi</i>)	SX	Large turbid rivers with moderate to fast flow and silty, sandy, or gravel substrate	Moderately Vulnerable	May expand range
29	Skipjack Herring (<i>Alosa chrysochloris</i>)	S3	Medium to large rivers and large impoundments with sand and gravel substrate	Moderately Vulnerable	May expand range
30	Banded Darter (<i>Etheostoma zonale</i>)	S3	Rivers and large creeks with moderate flow and cobble or gravel substrate	Presumed Stable	
31	Black Redhorse (<i>Moxostoma duquesnei</i>)	S2	Creeks and small to medium rivers with rocky/gravel substrate	Presumed Stable	
32	Blackside Darter (<i>Percina maculate</i>)	S3	Creeks and medium to small rivers with sand/gravel substrate and slow flowing water	Presume Stable	
33	Pearl Dace (<i>Margariscus margarita</i>)		Ponds and small lakes with sand/gravel substrate	Presumed Stable	
34	Redfin Shiner (<i>Lythrurus umbratilis</i>)	S4	Rivers, creeks, and streams	Presumed Stable	
35	Slenderhead Darter (<i>Percina phoxocephala</i>)	S3	Creeks and medium to small rivers with sand/gravel substrate and slow flowing water	Presumed Stable	
36	Tadpole Madtom (<i>Noturus gyrinus</i>)	S3	Lakes, impoundments, backwaters, creeks, and rivers with vegetation, minimal flow, and mucky substrate	Presumed Stable	
37	American Brook Lamprey (<i>Lampetra appendix</i>)	S3	Creeks and medium to small rivers	Presumed Stable	
38	Blue Catfish (<i>Ictalurus furcatus</i>)	S4	Rivers and backwaters	Presumed Stable	May expand range

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
39	Brown Bullhead (<i>Ameiurus nebulosus</i>)	S3	Ponds, lakes, impoundments, and slow flowing streams	Presumed Stable	
40	Chestnut Lamprey (<i>Ichthyomyzon castaneus</i>)	S2	Medium to large rivers	Presumed Stable	
41	Freckled Madtom (<i>Noturus nocturnes</i>)	S2	Moderately flowing creeks and rivers	Presumed Stable	May expand range
42	Goldeye (<i>Hiodon alosoides</i>)	SNR	Backwaters, lakes, and medium to large rivers	Presumed Stable	
43	Gravel Chub (<i>Erimystax x-punctatus</i>)	S3	Rivers and large creeks with gravel substrate	Presumed Stable	
44	Iowa Darter (<i>Etheostoma exile</i>)	S4	Cool creeks, ponds, and lakes with mucky/silty substrate and slow or no flow	Presumed Stable	
45	Largescale Stoneroller (<i>Campostoma oligolepis</i>)	S3	Clear medium to large streams with gravel substrate	Presumed Stable	May expand range
46	Least Darter (<i>Etheostoma microperca</i>)	S1	Slow flowing vegetated creeks	Presumed Stable	
47	*Longear Sunfish (<i>Lepomis megalotis</i>)	SX		Presumed Stable	
48	Longnose Gar (<i>Lepisosteus osseus</i>)	S3	Vegetated lakes, impoundments, and backwaters	Presumed Stable	
49	Mississippi Silvery Minnow (<i>Hybognathus nuchalis</i>)	S3?	Backwaters with minimal flow	Presumed Stable	May expand range
50	Mottled Sculpin (<i>Cottus bairdii</i>)	S2	Clear, cool creeks and small rivers with sand/gravel/rocky substrate	Presumed Stable	
51	Northern Logperch (<i>Percina caprodes</i>)	S3	Impoundments, lakes, and moderately to fast flowing creeks, streams, rivers, and lakes with sand/gravel substrate	Presumed Stable	
52	Pallid Shiner (<i>Hybopsis amnis</i>)	S3	Medium to large rivers with sandy/mucky substrate	Presumed Stable	May expand range
53	Plains Topminnow (<i>Fundulus sciadicus</i>)	SH	Creeks, streams, and backwaters with moderate flow	Presumed Stable	
54	Pugnose Minnow (<i>Opsopoeodus emiliae</i>)	S3	Vegetated lakes, impoundments, and slow flowing streams	Presumed Stable	May expand range
55	Shovelnose Sturgeon (<i>Scaphirhynchus platorynchus</i>)	S4	Large, turbid rivers	Presumed Stable	
56	Pugnose Shiner (<i>Notropis anogenus</i>)	S1	Clear, vegetated lakes with silt/sand/gravel substrate	Presumed Stable	

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
57	Spotted Sucker (<i>Minytrema melanops</i>)	S3	Small to medium slow flowing rivers with firm substrate	Presumed Stable	May expand range
58	River Darter (<i>Percina shumardi</i>)	S3	Large fast flowing rivers with rocky/gravel substrate	Presumed Stable	
59	Slender Madtom (<i>Noturus exilis</i>)	S3	Medium to large streams and small to medium rivers with moderate to fast flow	Presumed Stable	May expand range
60	Slimy Sculpin (<i>Cottus cognatus</i>)	S3	Cold, fast flowing streams with rocky substrate	Presumed Stable	May shift range/leave
61	Blue Sucker (<i>Cycleptus elongates</i>)	S3	Large rivers	Presumed Stable	May expand range
62	Ghost Shiner (<i>Notropis buchanani</i>)	S3	Slow flowing large creeks, and small to medium rivers	Presumed Stable	May expand range
63	Sicklefin Chub (<i>Macrhybopsis meeki</i>)	S1	Large turbid rivers with gravel/sand substrate	Presumed Stable	
64	Shoal Chub (<i>Macrhybopsis gelida</i>)	SNR	Moderate to fast flowing rivers with sand/cobble substrate	Presumed Stable	
65	Spotted Gar (<i>Lepisosteus oculatus</i>)	SNR	Moderately flowing medium to large rivers	Presumed Stable	May expand range
66	Sturgeon Chub (<i>Macrhybopsis gelida</i>)	SH	Warm, turbid rivers	Presumed Stable	
67	American Eel (<i>Anguilla rostrata</i>)	S3?	Lakes and large streams	Increase Likely	
68	Black Buffalo (<i>Ictiobus niger</i>)	S3	Backwaters, rivers, and impoundments	Increase Likely	May expand range
69	Blackstripe Topminnow (<i>Fundulus notatus</i>)	S3	Turbid streams and backwaters	Increase Likely	May expand range
70	Bowfin (<i>Amia calva</i>)	S3	Lakes and backwaters	Increase Likely	
71	Flathead Chub (<i>Platygobio gracilis</i>)	S3	Turbid rivers	Increase Likely	
72	Lake Sturgeon (<i>Acipenser fulvescens</i>)	S1	Large rivers and large lakes with sand/gravel/rock substrate	Increase Likely	
73	Northern Brook Lamprey (<i>Ichthyomyzon fossor</i>)	SNR	Moderate to fast flowing streams with mucky substrate	Increase Likely	
74	Blacknose Shiner (<i>Notropis heterolepis</i>)	S2	Cool creeks, small rivers, and lakes with sandy substrate	Increase Likely	

Mammals

The assessment showed mixed results for mammals. Half of the mammal species assessed were predicted to be vulnerable to climate change, five of which were extremely or highly vulnerable and four of which are moderately vulnerable (Table Appendix 21- 6). Populations for the other half of the mammals assessed are likely to remain stable and the Northern Long-eared Bat (*Myotis septentrionalis*) is predicted to increase. The eight non-SGCN mammals assessed were predicted to either maintain stable populations or increase. The Indiana Bat (*Myotis sodalis*) and the Evening Bat (*Nycticeius humeralis*) were predicted to expand their ranges and the Meadow Vole (*Microtus*

pennsylvanicus) was predicted to shift its range or possibly leave. It is important to recall that these predictions do not take into account the other threats to species persistence (e.g., White-nose Syndrome) as this assessment evaluated impacts attributable to climate change only. Mammals are a fairly mobile taxon and therefore may effectively adapt to climate change by moving to more suitable habitat. However, some species have specific habitat requirements or are dependent on other species for resources which may make them less capable of adapting to environmental changes by shifting their range.

Table Appendix 21- 6. Climate change vulnerability of mammals assessed in Iowa

Species names in bold are either federally or state listed as threatened or endangered. See appendix 14 for NatureServe’s state rank definitions and appendix 15 for specific threatened and endangered species listings. Common names with an asterisk (*) were non-SGCN species during time of assessment (2009-2011).

	Species	State Rank	Habitat Preference	Index Score
1	Plains Pocket Mouse (<i>Perognathus flavescens</i>)	S2	Prairie, sand, and loess	Extremely Vulnerable
2	Plains Pocket Gopher (<i>Geomys bursarius</i>)	S5	Grassland with warm season herbaceous grasses	Extremely Vulnerable
3	Franklin’s Ground Squirrel (<i>Spermophilus franklinii</i>)	S3	Tallgrass prairie, savanna, and roadsides	Highly Vulnerable
4	Red-backed Vole (<i>Myodes gapperi</i>)	S2	Forest	Highly Vulnerable
5	Woodland Vole (<i>Microtus pinetorum</i>)	S3	Forest	Highly Vulnerable
6	Short-tailed Shrew (<i>Blarina hylophaga</i>)	SNR	Forest, woodland, savanna, and grassland	Moderately Vulnerable
7	Southern Flying Squirrel (<i>Glaucomys volans</i>)	S4	Forest	Moderately Vulnerable
8	Southern Bog Lemming (<i>Synaptomys cooperi</i>)	S3	Moist grassland	Moderately Vulnerable
9	White-tailed Jackrabbit (<i>Lepus townsendii</i>)	S3	Shortgrass prairie and pasture	Moderately Vulnerable
10	Indiana Bat (<i>Myotis sodalis</i>)	S1	Forest, upland, and riparian areas	Presumed Stable
11	Evening Bat (<i>Nycticeius humeralis</i>)	S3	Forest and riparian areas	Presumed Stable
12	Hayden’s Shrew (<i>Sorex haydeni</i>)	S4	Grassland, woodland, and riparian areas	Presumed Stable
13	Least Shrew (<i>Cryptotis parva</i>)	S2	Woodland, savanna, grassland, and riparian areas	Presumed Stable
14	Red Squirrel (<i>Tamiasciurus hudsonicus</i>)	S3	Forest	Presumed Stable
15	Bobcat (<i>Lynx rufus</i>)	S3	Forest, woodland, and grassland	Presumed Stable
16	Gray Fox (<i>Urocyon cinereoargenteus</i>)	S3	Forest and woodland	Presumed Stable
17	Eastern Spotted Skunk (<i>Spilogale putorius</i>)	S1	Grassland, savanna, forest, and farmsteads	Presumed Stable
18	*Prairie Vole (<i>Microtus ochrogaster</i>)	S3	Warm season herbaceous grasses	Presumed Stable

	Species	State Rank	Habitat Preference	Index Score
19	*Meadow Vole (<i>Microtus pennsylvanicus</i>)	S5	Cool season grassland and herbaceous wetland	Presumed Stable
20	Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	S4	Forest	Increase Likely
21	*Fox Squirrel (<i>Sciurus niger</i>)	S5	Woodland and savanna	Increase Likely
22	*White-footed Deermouse (<i>Peromyscus leucopus</i>)	S5	Shrubland	Increase Likely
23	*Deer Mouse	S5	Agricultural land	Increase Likely
24	*Grasshopper Mouse (<i>Onychomys leucogaster</i>)	S3	Agricultural land	Increase Likely
25	*Western Harvest Mouse (<i>Reithrodontomys megalotis</i>)	S4	Agricultural land and warm season herbaceous grasses	Increase Likely
26	*American Beaver (<i>Castor canadensis</i>)	S5	Wet shrubland	Increase Likely

Mollusks

Eleven Iowa resident snails and all of the mussel species of greatest conservation need were assessed. Ten of the eleven snails (Table Appendix 21- 7) and all of the mussels (Table Appendix 21- 8) were predicted to be moderately or extremely vulnerable. Only one species, the Flamed Disc/Tigersnail (*Anguispira alternata*) was not determined to be vulnerable to climate change. Mollusks, in general, are more susceptible to climate change because they have limited mobility and some species have specific temperature and habitat requirements. Microclimates such as algific slopes are rare and the snail species that depend on them won't have access to an alternative environment if this unique habitat is altered too drastically. Mussels depend on fish hosts for dispersal, which are also subject to the effects of climate change, as they may shift their range or experience population declines. Only three of the mollusks were predicted to expand their range. These were the Wartyback (*Quadrula nodulata*), Ellipse (*Venustaconcha ellipsiformis*), and Elktoe (*Alasmidonta marginata*).

Table Appendix 21- 7. Climate change vulnerability of terrestrial snails assessed in Iowa

Species names in bold are either federally or state listed as threatened or endangered. See appendix 14 for NatureServe's state rank definitions and appendix 15 for specific threatened and endangered species listings. Common names with an asterisk (*) were non-SGCN species during time of assessment (2009-2011).

	Species	State Rank	Habitat Preference	Index Score
1	*Ice Thorn (<i>Carychium exile</i>)	SNR	Forest	Extremely Vulnerable
2	*Cherrystone Drop (<i>Hendersonia occulta</i>)	S3	Algific slopes within wet forests/woodland	Extremely Vulnerable
3	*Striped Whitelip (<i>Webbhelix multilineata</i>)	SNR	Wet forest/woodland	Extremely Vulnerable
4	*Six-whorl Vertigo (<i>Vertigo morsei</i>)	SNR	Wet shrubland/herbaceous wetland	Extremely Vulnerable
5	*Tapered Vertigo (<i>Vertigo elatior</i>)	SU	Wet forest/woodland and herbaceous wetland	Extremely Vulnerable
6	Bluff Vertigo (<i>Vertigo meramecensis</i>)	S1	Mesic, carbonate cliffs within hardwood forests that are covered in decomposed leaf litter, ferns, or moss and have patches of bare rock or scree.	Extremely Vulnerable

	Species	State Rank	Habitat Preference	Index Score
7	Iowa Pleistocene Snail (<i>Discus macclintocki</i>)	S1	Only found on moderate cliffs	Extremely Vulnerable
8	Minnesota Pleistocene Succinea (<i>Novasuccinea sp. Minnesota a</i>)	S1	Moderate cliffs	Extremely Vulnerable
9	Iowa Pleistocene Succinea (<i>Novasuccinea sp. Minnesota b</i>)	S1	Moderate cliffs	Extremely Vulnerable
10	Hubricht's Vertigo (<i>Vertigo hubrichti</i>)	S1	Forested algific slopes	Extremely Vulnerable
11	*Flamed Disc (Tigersnail) (<i>Anguispira alternata</i>)	SNR	Wet forest/woodland	Presumed Stable

Table Appendix 21- 8. Climate change vulnerability of mussels assessed in Iowa

Species names in bold are either federally or state listed as threatened or endangered. See appendix 14 for NatureServe's state rank definitions and appendix 15 for specific threatened and endangered species listings. Common names with an asterisk (*) were non-SGCN species during time of assessment (2009-2011).

	Species	State Rank	Habitat Preference	Index Score
1	Cylindrical Papershell (<i>Anodontoides ferussacianus</i>)	S2	Small creeks with mucky/silty substrate	Extremely Vulnerable
2	Butterfly (<i>Ellipsaria lineolata</i>)	S2	Large river with sand/gravel substrate	Extremely vulnerable
3	Slippershell Mussel (<i>Alasmidonta viridis</i>)	S1	Creeks and streams with mucky/sandy substrate	Extremely Vulnerable
4	Ebonysnail (<i>Fusconaia ebena</i>)	SX	Large, deep rivers with sand/gravel substrate	Extremely Vulnerable
5	Hickorynut (<i>Obovaria olivaria</i>)	SNR	Large river with sand/gravel substrate	Extremely Vulnerable
6	Higgins Eye (<i>Lampsilis higginsii</i>)	S1	Large river with sand/gravel substrate	Extremely Vulnerable
7	Bullhead (Sheepnose) (<i>Plethobasus cyphus</i>)	S1	Medium to large rivers with sand/gravel substrate	Extremely Vulnerable
8	Rock Pocketbook (<i>Arcidens confragosus</i>)	S2	Medium to large rivers with sand/muck substrate	Extremely Vulnerable
9	Round Pigtoe (<i>Pleurobema sintoxia</i>)	S1	Streams and rivers with firm sand/gravel substrate	Extremely Vulnerable
10	Yellow (Slough) Sandshell (<i>Lampsilis teres teres</i>)	S2	Slow flowing rivers and backwaters with mucky substrate	Extremely Vulnerable
11	Lilliput (<i>Toxolasma parvum</i>)		Ponds, lakes, creeks, and rivers with sand/gravel/mucky substrate	Extremely Vulnerable
12	Yellow Sandshell (<i>Lampsilis teres anodontoides</i>)	S2	Medium to large rivers with sand/gravel substrate	Extremely Vulnerable
13	Pondmussel (<i>Ligumia sunrostrata</i>)	SX	Small creeks and ponds with sand/mucky substrate	Extremely Vulnerable
14	Creeper/Strange Floater (<i>Strophitus undulatus undulatus</i>)	S2	Small to medium streams with sand/gravel/muck substrate	Extremely Vulnerable
15	Fawnsfoot (<i>Truncilla donaciformis</i>)	SNR	Medium to large rivers with sand/gravel substrate	Extremely Vulnerable

	Species	State Rank	Habitat Preference	Index Score
16	Wartyback (<i>Quadrula nodulata</i>)	S1	Large rivers with sand/gravel substrate	Extremely Vulnerable
17	Monkeyface (<i>Quadrula metanerva</i>)	S2	Medium to large rivers with gravel substrate	Extremely Vulnerable
18	Paper Pondshell (<i>Utterbackia imbecillus</i>)	SNR	Ponds, lakes, impoundments, and slow flowing rivers with mucky substrate	Extremely Vulnerable
19	Pondhorn (<i>Unio merus tetralasmus</i>)	SNR	Ponds, creeks, streams, and rivers with mucky/sandy substrate	Extremely Vulnerable
20	Ellipse (<i>Venustaconcha ellipsiformis</i>)	S2	Small to medium streams with sand/gravel substrate	Extremely Vulnerable
21	Pistolgrip (<i>Tritogonia verrucosa</i>)	S1	Medium to large rivers with sand/gravel/muck substrate	Extremely Vulnerable
22	Flutedshell (<i>Lasmigona costata</i>)	S2	Medium to large rivers with sand/gravel/muck substrate	Extremely Vulnerable
23	Creek Heelsplitter (<i>Lasmigona compressa</i>)	S2	Streams and creeks with sand/gravel substrate	Extremely Vulnerable
24	Spike (<i>Elliptio dilatata</i>)	S2	Streams and lakes with firm sand/gravel substrate	Extremely Vulnerable
25	Purple Wartyback (<i>Cyclonaias turberculata</i>)	S1	Medium to large rivers with gravel substrate	Extremely Vulnerable
26	Spectaclecase (<i>Cumberlandia monodonta</i>)	S1	Large fast flowing rivers with sand/muck substrate	Extremely Vulnerable
27	Elktoe (<i>Alasmidonta marginata</i>)	S3	Medium stream with moderate flow and sand/gravel substrate	Extremely Vulnerable
28	Ozark Pigtoe (<i>Fusconaia ozarkensis</i>)	SX	NA	Extremely Vulnerable
29	Flat Floater (<i>Anodonta suborbiculata</i>)	S3	Ponds, lakes, and rivers with muck/silt substrate - minimal to no water flow	Moderately Vulnerable

Butterflies

All butterfly species of greatest conservation need and nine other butterfly species found in Iowa were assessed. More than half of the butterfly species assessed (26 out of 46) were predicted to be vulnerable to climate change (

Table Appendix 21- 9). Almost one-third of the assessed species were determined to be extremely or highly vulnerable. Two species were predicted to increase, and these were not species of greatest conservation need. Butterflies are a fairly mobile group which would make dispersal possible to a certain degree. However, habitat fragmentation is of particular concern to Iowa's butterflies because of their reliance on prairie, grassland, and wetland habitats that are becoming less common on the landscape. Additionally, butterflies are associated with plants both as larval hosts and as sources of nectar for adults. Necessary host and nectar plants may also be affected by climate change. Plants that butterfly species rely on may become less common or the timing of their flowering events may shift out of balance with the butterfly life cycle. Migratory butterfly species will face the effects of climate change outside of Iowa as well, potentially increasing their vulnerability.

Table Appendix 21- 9. Climate change vulnerability of butterflies assessed in Iowa

Species names in bold are either federally or state listed as threatened or endangered. See Appendix 14 for NatureServe’s state rank definitions and appendix 15 for specific threatened and endangered species listings. Common names with an asterisk (*) were non-SGCN species during time of assessment (2009-2011).

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
1	Mottled Duskywing (<i>Erynnis martialis</i>)	S3	Xeric prairie with warm season herbaceous grasses	Extremely Vulnerable	
2	Two-spotted Skipper (<i>Euphyes bimacula</i>)	S3	Sedge meadows and marshes	Extremely Vulnerable	
3	Dakota Skipper (<i>Hesperia dacotae</i>)	S1	Prairie with warm season herbaceous grasses	Extremely Vulnerable	
4	Leonard’s Skipper (<i>Hesperia leonardus</i>)	S3	Open warm season herbaceous grassy areas and agricultural land	Extremely Vulnerable	
5	Ottoo Skipper (<i>Hesperia ottoe</i>)	S2	High quality mid/tallgrass prairie with warm season herbaceous grasses	Extremely Vulnerable	
6	*Crossline Skipper (<i>Polites origenes</i>)	S4	Dry, native prairie	Extremely Vulnerable	
7	Arogos Skipper (<i>Atrytone arogos</i>)	S2	Agricultural land, prairies and grasslands with warm season herbaceous grasses	Extremely Vulnerable	
8	Byssus Skipper (<i>Problema byssus</i>)	S2	Tallgrass prairie with warm season herbaceous grasses	Extremely Vulnerable	May expand range
9	Dusted Skipper (<i>Atrytonopsis hianna</i>)	S3	Agricultural land, bluestem grasslands, and oldfields with warm season herbaceous grasses	Extremely Vulnerable	
10	Baltimore Checkerspot (<i>Euphydryas phaeton phaeton</i>)	S2	Wetlands, fens, and bogs	Extremely Vulnerable	
11	Hickory Hairstreak (<i>Satyrium caryaevorum</i>)	S3	Forest	Highly Vulnerable	
12	Mulberry Wing (<i>Poanes massasoit</i>)	S2	Wetlands and fens	Highly Vulnerable	
13	Common Ringlet (<i>Coenonympha tullia</i>)	S1	Prairie and marsh edge, road ditches with warm season herbaceous grasses	Highly Vulnerable	
14	Poweshiek Skipperling (<i>Oarisma Poweshiek</i>)	S1	High quality prairie with warm season herbaceous grasses	Highly Vulnerable	
15	*Henry’s Elfin (<i>Callophrys henrici</i>)	S3	Woodland	Moderately Vulnerable	
16	Acadian Hairstreak (<i>Satyrium acadica</i>)	S3	Riparian areas, wet forest/woodlands, and prairie	Moderately Vulnerable	
17	Purplish Copper (<i>Lycaena helloides</i>)	S3	Moist or disturbed areas/agricultural land	Moderately Vulnerable	

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
18	Melissa Blue (<i>Lycaena melissa</i>)	S3	Xeric prairie and gravel ridges with warm season herbaceous grasses	Moderately Vulnerable	
19	Regal Fritillary (<i>Speyeria idalia</i>)	S2	Agricultural land, prairie, and open grassland with warm season herbaceous grasses	Moderately Vulnerable	
20	Olympia Marble (<i>Euchloe olympia</i>)	S3	Open woods/savanna, river bluffs, poor soils, and grasslands with warm season herbaceous grasses	Moderately Vulnerable	
21	Silvery Blue (<i>Glaucopsyche lygdamus</i>)	S3	Prairie, open fields, and woodland openings, with warm season grasses	Moderately Vulnerable	
22	Edward's Hairstreak (<i>Satyrium edwardsii</i>)	S3	Woodlands, clearings, and areas of poor soil	Moderately Vulnerable	
23	Wild Indigo Duskywing (<i>Erynnis baptisiae</i>)	S3	Roadsides, prairie with herbaceous grasses, and agricultural land	Moderately Vulnerable	May expand range
24	Dion Skipper (<i>Euphyes dion</i>)	S3	Sedge wetlands	Moderately Vulnerable	
25	Broad-winged Skipper (<i>Poanes viator</i>)	S3	Wetland fens	Moderately Vulnerable	
26	Hayhurst's Scallopwing (<i>Staphylus hayhurstii</i>)	SNR	Floodplain forests, Loess Hills forest, Savanna	Moderately Vulnerable	May expand range
27	Zabulon Skipper (<i>Poanes zabulon</i>)	S3	Riparian, oldfield, woodland edges, and agricultural land	Presumed Stable	May expand range
28	Pipevine Swallowtail (<i>Battus philenor</i>)	S3	Forest, open fields, and roadsides	Presumed Stable	May expand range
29	*Great Spangled Fritillary (<i>Speyeria Cybele</i>)	S4	Woodland, forest edge, old fields, and roadsides	Presumed Stable	
30	Striped Hairstreak (<i>Satyrium liparops</i>)	S3	Forest opening and edges, prairie streamside	Presumed Stable	
31	Compton Tortoiseshell (<i>Nymphalis vaualbum</i>)	SNR	Large tracts of forest	Presumed Stable	May shift range/leave
32	White M Hairstreak (<i>Parrhasius m-album</i>)	SNR	Woodland and savanna	Presumed Stable	May shift range/leave
33	Aphrodite Fritillary (<i>Speyeria aphrodite</i>)	S4	High quality prairie with warm season herbaceous grasses, wetland, and fen habitat	Presumed Stable	
34	Pepper and Salt Skipper (<i>Amblyscirtes vialis</i>)	SNR	Edge of woods and grass waterways/agricultural land	Presumed Stable	
35	Common Roadside-Skipper (<i>Amblyscirtes vialis</i>)	S3	Dry prairie and limestone/sandstone glades	Presumed Stable	
36	Zebra Swallowtail (<i>Eurytides Marcellus</i>)	S1	Woodland along rivers	Presumed Stable	May expand range

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
37	Sleepy Duskywing (<i>Erynnis brizo</i>)	S3	Oak barrens sand or shale soils	Presumed Stable	
38	Dreamy Duskywing (<i>Erynnis icelus</i>)	S3	Woodland or edge habitat/savanna	Presumed Stable	
39	Columbine Duskywing (<i>Erynnis lucilius</i>)	S3	Rocky wooded ravines	Presumed Stable	
40	*Hobomok Skipper (<i>Poanes hobomok</i>)	S4	Woodland	Presumed Stable	
41	*Tawny-edged Skipper (<i>Polites themistocles</i>)	S5	Native prairie, old fields, and city parks	Presumed Stable	
42	*Northern Cloudywing (<i>Thorybes pylades</i>)	S4	Dry, open habitat in prairies and old fields	Presumed Stable	
43	*Delaware Skipper (<i>Anatrytone logan</i>)	S5	Marshes, pastures, meadows, native prairie, and roadsides	Presumed Stable	
44	Reakirt's Blue (<i>Echinargus isola</i>)	SNR	Native prairie with warm season herbaceous grasses	Presumed Stable	May expand range
45	*Summer Azure (<i>Celastrina neglecta</i>)	SNR	Woodland	Increase Likely	
46	*Eastern Tailed-blue (<i>Everes comynatas</i>)	S5	Generalist	Increase Likely	

Odonata

The dragonfly and damselfly species of greatest conservation need were assessed revealing mixed results for this group of organisms. Slightly fewer than half (12 out of 28 assessed) of the odonata appear to be vulnerable to the effects of climate change, with eight being extremely or highly vulnerable (Table Appendix 21- 10). Three species may experience population increases. Odonata are fairly capable of shifting their ranges in response to climate change. However, specific diet and habitat requirements may limit their ability to adapt to the changing environment. Some of these species also depend on ephemeral wetlands which may be permanently affected by extreme events such as drought.

Table Appendix 21- 10. Climate change vulnerability of odonates assessed in Iowa

Species names in bold are either federally or state listed as threatened or endangered. See appendix 14 for NatureServe's state rank definitions and appendix 15 for specific threatened and endangered species listings. Common names with an asterisk (*) were non-SGCN species during time of assessment (2009-2011).

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
1	Sioux Snaketail (<i>Ophiogomphus smithi</i>)	SNR	Sand bottomed streams	Extremely Vulnerable	
2	Prairie Bluet (<i>Coenagrion angulatum</i>)	S2	Lakes and ponds	Extremely Vulnerable	
3	Boreal Bluet (<i>Enallagma boreale</i>)	S1	Marsh	Extremely Vulnerable	
4	Sweetflag Spreadwing (<i>Lestes forcipatus</i>)	S1	Marshes and pond edges	Extremely Vulnerable	
5	Elegant Spreadwing (<i>Lestes inaequalis</i>)	S1	Ponds	Extremely Vulnerable	

	Species	State Rank	Habitat Preference	Index Score	Predicted Effect on Species Range
6	Paiute Dancer (<i>Argia alberta</i>)	S2	Small streams and road ditches	Highly Vulnerable	
7	Alkali Bluet (<i>Enallagma clausum</i>)	S2	Pond edges without vegetation	Highly Vulnerable	
8	Spotted Spreadwing (<i>Lestes congener</i>)	S2	Edges, pools, backwaters, and marshes	Highly Vulnerable	
9	Spangled Skimmer (<i>Libellula cyanea</i>)	S1	Artificial ponds and lakes	Moderately Vulnerable	May expand range
10	Rusty Snaketail (<i>Ophiogomphus rupinsulensis</i>)	S1	Sandy, rocky creeks	Moderately Vulnerable	
11	Emma's Dancer (<i>Argia emma</i>)	S1	Small streams	Moderately Vulnerable	
12	Vesper Bluet (<i>Enallagma vesperum</i>)	S2	Deep lakes and ponds	Moderately Vulnerable	
13	Carolina Saddlebags (<i>Tamea Carolina</i>)	S1	Marsh	Presumed Stable	May expand range
14	Blue-faced Meadowhawk (<i>Sympetrum ambiguum</i>)	S1	Temporary pools and oxbows	Presumed Stable	May expand range
15	Four-spotted Skimmer (<i>Libellula quadrimaculata</i>)	S2	Marshes and wooded ponds	Presumed Stable	
16	Stygian Shadowdragon (<i>Neurocordulia yamaskanensis</i>)	S1	Mississippi River	Presumed Stable	
17	Brimstone Clubtail (<i>Stylurus intricatus</i>)	S1	Sandy streams	Presumed Stable	
18	Rapids Clubtail (<i>Gomphus quadricolor</i>)	S1	Rocky creeks	Presumed Stable	
19	Sulphur-tipped Clubtail (<i>Gomphus militaris</i>)	S1	Lakes and artificial ponds	Presumed Stable	May expand range
20	Slaty Skimmer (<i>Libellula incesta</i>)	SNR	Old river oxbow	Presumed Stable	May expand range
21	Mocha Emerald (<i>Somatochlora linearis</i>)	SNR	Wooded edges/streams	Presumed Stable	May expand range
22	Cyrano Darner (<i>Nasiaeschna pentacantha</i>)	S1	Shaded creeks, lakes, and oxbows	Presumed Stable	
23	Blue-eyed Darner (<i>Rhionaeschna multicolor</i>)	S2	Small lakes, and ponds	Presumed Stable	
24	Green-striped Darner (<i>Aeshna verticalis</i>)	S1	Marshes and pond edges	Presumed Stable	
25	Variable Darner (<i>Aeshna interrupta</i>)	S2	Lakes, ponds, and streams	Presumed Stable	
26	Smoky Shadowdragon (<i>Neurocordulia molesta</i>)	S2	Large rivers	Increase Likely	May expand range
27	Royal River Cruiser (<i>Macromia taeniolata</i>)	S2	Lakes and rivers	Increase Likely	May expand range
28	Canada Darner (<i>Aeshna Canadensis</i>)	S2	Marshes and pond edges	Increase Likely	May shift range/leave

Additional Factors Considered

Regional Assessment

Iowa DNR participated in an effort to compare the results of the climate change vulnerability assessment described above across a broader region, including Illinois, Iowa and Nebraska. Four independent teams used NatureServe's Climate Change Vulnerability Index to assess the potential impacts of climate change to wildlife species across these three states. Some patterns that emerged from looking at the results within a broader regional context include the fact that over half of the >550 species assessed were vulnerable to climate change in at least one state, and that species dependent upon freshwater ecosystems were found likely to be at greater risk from climate change than more terrestrial species.

Potential Effects of Climate Change on Ranges and Prevalence of Non-native Species

The primary focus of this assessment is species of concern that are native to Iowa. However, when assessing the state's vulnerability to climate change it is also important to consider the effects of potentially invasive non-native species that may pose a threat to Iowa's biodiversity. In order to provide a more thorough report on Iowa's vulnerability to climate change, the Iowa Department of Natural Resources sought information about the risk of certain species to become invasive in Iowa through natural range expansion or artificial introduction. This type of assessment takes into consideration the current known ecological habitat and climate preferences of a species and compares it to predicted climate change scenarios in order to identify new regions where a species may thrive.

Six species were selected and assessed for the risk that they would become invasive in Iowa as the climate changes (Ingenloff et al. 2011). These species were selected based on their ability to colonize new regions, their risk to Iowa's native species if they successfully invaded, and the availability of adequate information about each species for use in the modeling tools. The process of assessing the potential risk of a species becoming invasive in Iowa promotes awareness about the potential for species that may not seem relevant now to become management concerns in the future. It also shows the usefulness of niche modeling for predicting which species may be of concern and which are unlikely to colonize Iowa's habitats. Information for Table Appendix 21- 11 was taken from the 2011 *Risk Analysis of the Invasive Potential of 6 Species in Iowa: Utilizing Ecological Niche Modeling to Assess Climatic Suitability in 2050 and 2090* document produced by the University of Kansas. It shows that the Asian Rock Pool Mosquito (*Aedes japonicas*) and the Red Swamp Crayfish (*Procambarus clarkii*) have a high risk of becoming invasive species in Iowa. These species are highly successful colonizers. The Asian Rock Pool Mosquito, a known carrier of West Nile virus, has already been documented in Iowa and although the Red Swamp Crayfish hasn't been found in Iowa yet, it has successfully colonized five of the world's seven continents due to its tolerance of a wide variety of habitat conditions. The New Zealand Mudsnail (*Potamopyrgus antipodarum*) and the Chinese Bushclover (*Lespedeza cuneata*) are also highly adaptable and have become invasive in other regions. However, they are classified at a moderate-high threat because they are currently not within close enough proximity to Iowa to be a serious threat. The Parrot-feather (*Myriophyllum aquaticum*) and Round Goby (*Neogobius melanostomus*) were considered only moderate risks because although they are known to successfully colonize new regions, they may not encounter suitable conditions in Iowa even as the climate changes. The same adaptive characteristics that make some of Iowa's native species adaptable to climate change, such as dispersal ability and flexibility in habitat and diet requirements, make non-native species successful invaders. As with the predictions for Iowa's native species, the model projections simply indicate what may be possible given the known parameters. Therefore, this data is meant to help managers prepare for a changing environment rather than specifically predict what Iowa's environment will be like in the future.

Table Appendix 21- 11. Non-native species that may become invasive in Iowa as climate change progresses
 As determined by the 2011 *Risk Analysis of the Invasive Potential of 6 Species in Iowa: Utilizing Ecological Niche Modeling to Assess Climatic Suitability in 2050 and 2090* report produced by the University of Kansas.

Species	Native Region	Invasion Risk	Justification
Asian Rock Pool Mosquito (<i>Aedes japonicas</i>)	Japan and Korea	High	<ul style="list-style-type: none"> • Predicted increasing climatic suitability within Iowa • Successful colonizer • Already found in Iowa and neighboring states
Red Swamp Crayfish (<i>Procambarus clarkii</i>)	South central U.S. and northern Mexico	High	<ul style="list-style-type: none"> • Predicted large climatically suitable areas within Iowa and neighboring states • Has successfully colonized five continents • Disperses easily and quickly
New Zealand Mudsnaill (<i>Potamopyrgus antipodarum</i>)	Lakes in rivers in New Zealand and nearby islands	Moderate-High	<ul style="list-style-type: none"> • History of high invasion capability due to adaptability • Generalist invader
Chinese Bushclover (<i>Lespedeza cuneata</i>)	Korea, China, Taiwan, India, Japan, and Australia	Moderate-High	<ul style="list-style-type: none"> • Aggressive and hardy • Thrives in disturbed habitats and low quality soils • Dispersed via herbivores • Present in adjacent states
Round Goby (<i>Neogobius melanostomus</i>)	Black and Caspian Seas	Moderate	<ul style="list-style-type: none"> • Potential to be established in basis adjacent to Iowa • Future projections predict no suitability by 2050
Parrot-feather (<i>Myriophyllum aquaticum</i>)	Argentina, Bolivia, Brazil, Chile, Ecuador, Paraguay, and Peru	Moderate	<ul style="list-style-type: none"> • Established in nearby states • Dispersed by humans • Hardy

Implications

This climate change vulnerability assessment identified Iowa species that may be particularly susceptible to the effects of climate change and briefly covers the potential for invasive species to become a problem in the future. Despite identifying species that may be of increased conservation concern, the results of the assessment did not indicate any clear and specific reasons for the increased vulnerability of native species or threats of potential invasive species. There was no obvious correlation between habitat preference and vulnerability to climate change for the native species, indicating that all habitat types will contain species with varying levels of vulnerability. Therefore, before proceeding with any management plan, it may be most effective to identify a particular species or group of species that will be more intensely affected by climate change and then identify the ways the climate is affecting their habitat. However, in general, habitats that are more diverse are also more resilient to any sort of ecological challenges so managing for ecological diversity is still an important goal. State rank was also not directly correlated with the degree to which any species would be vulnerable to climate change. This shows that species that are now of conservation concern may not be as threatened in the future, and species that are prevalent today may not remain common as the climate changes. Additionally, species that currently do not thrive in Iowa may arrive in the state and

pose problems for native flora and fauna. Therefore, monitoring will continue to be an important source of information for the status of wildlife populations. Managing for habitat connectivity will be important for native species that may need to shift their ranges in response to climate change and vigilant prevention of non-native species translocation will continue to be important for preventing the spread of potential invasive species.

The NatureServe tool used in this assessment makes predictions about the vulnerability of populations based solely on risks associated with climate change. Managers must consider risk factors affecting these species that are not associated with climate change and combine that knowledge with the information in this assessment in order to design and implement future conservation efforts that will effectively address the needs of vulnerable species. Prioritizing species of concern is an efficient and cost-effective way of considering conservation challenges and future management approaches. However, as with any prediction of the future, there is uncertainty in the results of this assessment, and it should not be the only tool used to identify species of concern. The goals of this assessment were to promote discussion about climate change vulnerability, prioritize species, inform management, and identify possible focuses of future monitoring efforts and land acquisition. Being aware of the possible threats of climate change will be important for designing relevant and effective management practices in the years to come.

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Appendix 22. Conservation Measures

Partnership’s Taxonomy of Threats

Threats Taxonomy: World Conservation Union – Conservation Measures Partnership classification of direct threats to biodiversity (version 2.0). Despite the label “threats,” the items on this list are not inherently positive or negative for wildlife or habitats. Rather, the list includes and categorizes all *potential* threats to species and natural communities.

Threats	Definition
1. Residential & Commercial Development	Threats from human settlements or other non-agricultural land uses with a substantial footprint
1.1 Housing & Urban Areas	Human cities, towns, and settlements including non-housing development typically integrated with housing
1.2 Commercial & Industrial Areas	Factories and other commercial centers
1.3 Tourism & Recreation Areas	Tourism and recreation sites with a substantial footprint
2. Agriculture & Aquaculture	Threats from farming and ranching as a result of agricultural expansion and intensification, including silviculture, mariculture and aquaculture
2.1 Annual & Perennial Non-Timber Crops	Crops planted for food, fodder, fiber, fuel, or other uses
2.2 Wood & Pulp Plantations	Stands of trees planted for timber outside of natural forests, often with non-native species
2.3 Livestock Farming & Ranching	Domestic terrestrial animals raised in one location on farmed or non-local resources (farming); also domestic or semi-domesticated animals allowed to roam in the wild and supported by natural habitats (ranching)
2.4 Marine & Freshwater Aquaculture	Aquatic animals raised in one location on farmed or non-local resources; also hatchery fish allowed to roam in the wild
3. Energy Production & Mining	Threats from production of nonbiological resources
3.1 Oil & Gas Drilling	Exploring for, developing, and producing petroleum and other liquid hydrocarbons
3.2 Mining & Quarrying	Exploring for, developing, and producing minerals and rocks
3.3 Renewable Energy	Exploring, developing and producing renewable energy
4. Transportation & Service Corridors	Threats from long narrow transport corridors and the vehicles that use them including associated wildlife mortality
4.1 Roads & Railroads	Surface transport on roadways and dedicated tracks
4.2 Utility & Service Lines	Transport of energy & resources
4.3 Shipping Lanes	Transport on and in freshwater and ocean waterways
4.4 Flight Paths	Air and space transport
5. Biological Resource Use	Threats from consumptive use of “wild” biological resources including both deliberate and unintentional harvesting effects; also persecution or control of specific species
5.1 Hunting and Collecting Terrestrial Animals	Killing or trapping terrestrial wild animals or animal products for commercial, recreation, subsistence, research or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch

Threats	Definition
5.2 Gathering Terrestrial Plants	Harvesting plants, fungi, and other non-timber/non-animal products for commercial, recreation, subsistence, research or cultural purposes, or for control reasons
5.3 Logging & Wood Harvesting	Harvesting trees and other woody vegetation for timber, fiber, or fuel
5.4 Fishing & Harvesting Aquatic Resources	Harvesting aquatic wild animals or plants for commercial, recreation, subsistence, research, or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch
6. Human Intrusions & Disturbance	Threats from human activities that alter, destroy and disturb habitats and species associated with non-consumptive uses of biological resources
6.1 Recreational Activities	People spending time in nature or traveling in vehicles outside of established transport corridors, usually for recreational reasons
6.2 War, Civil Unrest & Military Exercises	Actions by formal or paramilitary forces without a permanent footprint
6.3 Work & Other Activities	People spending time in or traveling in natural environments for reasons other than recreation, military activities, or research
7. Natural Systems Modification	Threats from actions that convert or degrade habitat in service of “managing” natural or semi-natural systems, often to improve human welfare
7.1 Fire & Fire Suppression	Suppression or increase in fire frequency and/or intensity outside of its natural range of variation
7.2 Dams & Water Management/Use	Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities
7.3 Other Ecosystem Modifications	Other actions that convert or degrade habitat in service of “managing” natural systems to improve human welfare
7.4 Removing/Reducing Human Maintenance	Absence or reduction of current or historical maintenance regimes important for key ecological attributes. Includes regimes historically maintained by protected area staff, farmers and ranchers, indigenous peoples, private landowners, or any other resource manager
8. Invasive & Other Problematic Species & Genes	Threats from non-native and native plants, animals, pathogens/microbes, or genetic materials that have or are predicted to have harmful effects on biodiversity following their introduction, spread and/or increase in abundance
8.1 Invasive Non-Native/Alien Species	Harmful plants, animals, pathogens and other microbes not originally found within the ecosystem(s) in question and directly or indirectly introduced and spread into it by human activities (e.g. household pets, zebra mussels, purple loosestrife)
8.2 Problematic Native Species	Harmful plants, animals, or pathogens and other microbes that are originally found within the ecosystem(s) in question, but have become 'out-of-balance' or 'released' directly or indirectly due to human activities
8.3 Introduced Genetic Material	Human altered or transported organisms or genes
8.4 Pathogens & Microbes	Harmful native and non-native agents that cause disease or illness to a host, including bacteria, viruses, prions, fungi, and other microorganisms (e.g. Chytrid fungus, Dutch Elm Disease, Chronic Wasting Disease)
9. Pollution	Threats from introduction of exotic and/or excess materials or energy from point and nonpoint sources
9.1 Household Sewage & Urban Waste Water	Water-borne sewage and non-point runoff from housing and urban areas that include nutrients, toxic chemicals and/or sediments
9.2 Industrial & Military Effluents	Water-borne pollutants from industrial and military sources including mining, energy production, and other resource extraction industries that include nutrients, toxic chemicals and/or sediments

Threats	Definition
9.3 Agricultural & Forestry Effluents	Water-borne pollutants from agricultural, silvicultural, and aquaculture systems that include nutrients, toxic chemicals and/or sediments including the effects of these pollutants on the site where they are applied
9.4 Garbage & Solid Waste	Rubbish and other solid materials including those that entangle wildlife
9.5 Air-Borne Pollutants	Atmospheric pollutants from point and nonpoint sources
9.6 Excess Energy	Inputs of heat, sound, or light that disturb wildlife or ecosystems
10. Geological Events	Threats from catastrophic geological events
10.1 Volcanoes	Volcanic events
10.2 Earthquakes/Tsunamis	Earthquakes and associated events
10.3 Avalanches/Landslides	Avalanches or landslides
11. Climate Change	Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events that are outside of the natural range of variation, or potentially can wipe out a vulnerable species or habitat
11.1 Ecosystem Encroachment	Large-scale effects of ecosystems shifting and impinging on other species and ecosystems.
11.2 Changes in Geochemical Regimes	Broad-scale changes in the geochemical conditions of ecosystems including ocean acidification (e.g. changes in atmospheric CO ₂ affecting plant growth, loss of sediment leading to broad-scale subsidence)
11.3 Changes in Temperature Regimes	Broad-scale changes in temperature mean, variability, seasonality, and extremes, including changes in temperature extremes, increased average summer temperature, and decreased minimum winter/spring temperature
11.4 Changes in Precipitation & Broad-Scale Hydrological Regimes	Broad-scale changes in precipitation mean, variability, seasonality, and extremes, including decreased or increased precipitation, changes in timing of precipitation, changes in form of precipitation (e.g., snow vs rain; snowcover and snowpack where applicable), changes in evapotranspiration rates and hydrological cycles, and droughts and floods (e.g. droughts, changes in timing of rains, increased severity of floods, loss of snowcover)
11.5 Severe/Extreme Weather Events	Changes in frequency, timing and/or intensity of storms as well as severe weather events that threaten targets that have lost resilience

Appendix 23. Conservation Actions Taxonomy

Actions Taxonomy: World Conservation Union – Conservation Measures Partnership classification of direct threats to biodiversity (version 2.0). Because this Conservation Actions taxonomy was developed to be inclusive of all types of conservation across the globe, some actions listed below may not be particularly relevant to Implementation of this Plan, and inclusion here does not imply that this Plan recommends or supports undertaking any of the following actions. Recommended actions are listed in Chapter 6 on pages 3-13, with a cross-walk to the actions taxonomy presented in this Appendix. The purpose of providing the taxonomy is to provide an organizational framework by which conservation efforts can be presented across species groups or ecosystem types, across entities, and across states and regions.

Conservation Actions	Definition
A. Target Restoration/Stress Reduction Actions	Actions to directly restore a target or mitigate a stress
1. Land/Water Management	Actions directed at conserving or restoring sites, ecosystems and the wider environment
1.1 Site/Area Stewardship	Enhancing viability/mitigating stresses for sites and/or ecosystem targets
1.2 Ecosystem & Natural Processes (Re)Creation	Restoring missing or severely degraded ecosystems and ecosystem function, especially on a large scale
2. Species Management	Actions directed at conserving or restoring specific species
2.1 Species Stewardship	Enhancing viability/mitigating stresses to specific species targets within their current range
2.2 Species Re-Introduction & Translocation	Re-introducing species to places where they formerly occurred or to suitable future habitat or benign introductions of species to an ecosystem
2.3 Ex-Situ Conservation	Protecting biodiversity out of its native habitats with the aim of ultimately restoring it to these habitats
B. Behavioral Change / Threat Reduction Actions	Actions to get people to stop direct threats or continue/increase positive behaviors
3. Awareness Raising	Actions designed to make people aware of key issues, thus leading to behavior change
3.1 Outreach & Communications	Promoting desired behavioral change by providing information through various media and other channels
3.2 Protests & Civil Disobedience	Promoting desired behavioral change by conducting protests or other confrontational means
4. Law Enforcement & Prosecution	Monitoring and enforcing compliance with existing laws, policies & regulations, and standards & codes at all levels
4.1 Detection & Arrest	Detecting and/or directly stopping violations of existing laws, policies/regulations and standards/legal codes
4.2 Criminal Prosecution & Conviction	Ensuring sanctions for violations of existing laws, policies/regulations and standards/legal codes
4.3 Non-criminal Compliance Enforcement	Threatening or bringing non-criminal legal action to get individuals, organizations, or firms to change behavior
5. Livelihood, Economic & Moral Incentives	Actions using livelihood, economic and moral incentives to directly influence behavior or to change attitudes that then lead to behavioral change
5.1 Linked Enterprises & Livelihoods	Developing enterprises that directly depend on the maintenance of natural resources or provide substitute livelihoods as a means of changing behaviors or attitudes

Conservation Actions	Definition
5.2 Substitution & Alternative Livelihoods	Promoting alternative products and services that substitute for environmentally damaging ones
5.3 Market Forces	Using market mechanisms to change behaviors and attitudes
5.4 Valuation of / Payments for Ecosystem Services	Using direct or indirect payments for ascribing economic value to change behaviors and attitudes
5.5 Non-Monetary Values	Using intangible and moral values to change behaviors and attitudes
C. Enabling Condition Actions	Actions that create the conditions necessary for other conservation efforts to succeed
6. Conservation Design & Planning	Actions to legally or formally protect sites and/or species
6.1 Site/Area Protection	Legally or formally establishing or expanding public or private parks, reserves, and other protected areas roughly equivalent to IUCN Categories I-VI*
6.2 Easements & Resource Rights	Legally or formally establishing protection or easements of some specific aspect of the resource on private lands outside of IUCN Categories I-VI
6.3 Land/Water Use Planning & Zoning	Legally or formally designating land or water uses
6.4 Site/Area Planning & Monitoring	General planning and monitoring of public or private parks, reserves and other protected areas roughly equivalent to IUCN Categories I-VI*
6.5 Site Infrastructure	Creating and maintaining the physical infrastructure for protected areas and other conservation sites
6.6 Species Designation, Planning & Monitoring	General designation and management of specific plant and animal populations of concern
7. Law & Policy	Actions to develop, change, and influence formal legislation, regulations, and voluntary standards
7.1 Legislation	Making, implementing, changing, influencing, or providing input into formal government sector legislation at all levels: international, national, state/provincial, municipal, tribal
7.2 Policies & Regulations	Making, implementing, changing, influencing, or providing input into policies and regulations affecting the implementation of laws and codes at all levels: international, national, state/provincial, municipal, tribal private
7.3 Private Sector Standards & Codes	Setting, implementing, changing, influencing, or providing input into voluntary standards & professional codes that govern private sector practice
7.4 Compliance & Enforcement Capacity	Monitoring and enforcing compliance with laws, policies & regulations, and standards & codes at all levels
8. Research & Monitoring	Basic and applied research to support conservation work
8.1 Basic Research & Status Monitoring	Basic research related to conservation
8.2 Effectiveness Monitoring / Adaptive Management	Assessment of and learning about the effectiveness of strategies
9. Education & Training	Enhancing knowledge and skills of specific individuals
9.1 Formal Education	Enhancing knowledge and skills of students in a formal degree program
9.2 Training & Capacity Development	Enhancing knowledge, skills and information exchange for practitioners, stakeholders, and other relevant individuals in structured settings outside of degree programs
10. Institutional Development	Creating the institutions needed to support conservation work

Conservation Actions	Definition
10.1 Organizational Management & Administration	Doing the work needed to establish and operate conservation organizations and agencies
10.2 Institutional & Civil Society Development	Creating or providing non-financial support & capacity building for non-profits, government agencies, communities, and for-profits
10.3 Alliance & Partnership Development	Forming and facilitating partnerships, alliances, and networks of organizations
10.4 Financing Conservation	Raising and providing funds for conservation work

*IUCN Protected Areas Categories System: IUCN protected area management categories classify protected areas according to their management objectives. For more information, visit:

http://www.iucn.org/about/work/programmes/gpap_home/gpap_quality/gpap_pacategories/

Category Ia: Strict Nature Reserve

Category Ib: Wilderness Area

Category II: National Park

Category III: Natural Monument or Feature

Category IV: Habitat/Species Management Area

Category V: Protected Landscape/Seascape

Category VI: Protected area with sustainable use of natural resources

Appendix 24. Additional Resources

Natural Resource Management & Scientific Agencies in Iowa

Agency Name	Website
US Army Corps of Engineers – Lakes Gateway page for Iowa	http://corpsslakes.usace.army.mil/visitors/states.cfm?state=IA
Conservation Districts of Iowa	http://cdiowa.org/
Iowa’s County Conservation System	http://www.mycountyparks.com/Info/IACCB.aspx
US Fish and Wildlife Service	http://www.fws.gov
US Forest Service	http://www.fs.fed.us/
US Geological Survey	http://www.usgs.gov/
Iowa Fish and Wildlife Cooperative Research Unit	http://www.cfwru.iastate.edu/
Iowa Department of Natural Resources	http://www.iowadnr.gov
National Park Service National Natural Landmark Program page for Iowa	http://www.nature.nps.gov/nnl/state.cfm?State=IA
US Department of Agriculture – Natural Resources Conservation Service’s Iowa homepage	http://www.nrcs.usda.gov/wps/portal/nrcs/site/ia/home/

Partnerships and Coalitions

Partnership Name	Website
Association of Fish and Wildlife Agencies	http://www.fishwildlife.org/
Iowa is within the spatial scope of one regional association of fish and wildlife agencies:	
Midwest Association of Fish and Wildlife Agencies	http://www.mafwa.org/
Iowa Conservation Alliance	http://iowaconservationalliance.com/
Iowa Monarch Conservation Coalition	http://monarch.ent.iastate.edu/
Monarch Joint Venture	http://www.monarchjointventure.org/
National Bobwhite Conservation Initiative	http://bringbackbobwhites.org/
National Climate Change and Wildlife Science Center	https://nccwsc.usgs.gov/
Iowa is within the spatial scope of two Climate Science Centers:	
1. North Central Climate Science Center	http://revampclimate.colostate.edu/
2. Northeast Climate Science Center	https://necsc.umass.edu/
National Fish Habitat Partnership	http://www.fishhabitat.org/
Iowa is within the spatial scope of three fish habitat partnerships:	
1. Driftless Area Restoration Effort	http://www.tu.org/tu-projects/driftless-area-restoration-effort
2. Midwest Glacial Lakes Partnership	http://midwestglaciallakes.org/
3. Fishers and Farmers Partnership for the Upper Mississippi River Basin	http://fishersandfarmers.org/
Migratory Bird and All-Bird Joint Ventures	http://www.fws.gov/birds/management/bird-conservation-partnership-and-initiatives/migratory-bird-joint-ventures.php

Partnership Name	Website
Iowa is within the spatial scope of two Joint Ventures:	
1. Upper Mississippi River & Great Lakes Region Joint Venture	http://uppermissgreatlakesjv.org/
2. Prairie Pothole Joint Venture	http://ppjv.org/
Landscape Conservation Cooperatives (LCCs)	http://lccnetwork.org/
Iowa is within the spatial scope of three LCCs:	
1. Upper Midwest and Great Lakes LCC	http://greatlakeslcc.org/
2. Eastern Tallgrass Prairie and Big Rivers LCC	http://www.tallgrassprairielcc.org/
3. Plains and Prairie Potholes LCC	http://www.plainsandprairiepotholeslcc.org/
NatureServe (network of state natural heritage programs and other independent organizations)	http://www.natureserve.org
North American Bird Conservation Initiative	http://www.nabci-us.org
Partners in Amphibian and Reptile Conservation	http://parcplace.org/
Midwest Partners in Amphibian and Reptile Conservation	http://mwparc.org/
Partners in Flight US	http://www.partnersinflight.org
Avian Knowledge Network	http://www.avianknowledge.net/
Iowa is within the spatial scope of the Midwest Node of the Avian Knowledge Network	
Midwest Coordinated Bird Monitoring Partnership and Midwest Avian Data Center	http://midwestbirdmonitoring.ning.com/ http://data.pointblue.org/partners/mwadc/
Plant.Grow.Fly	http://www.blankparkzoo.com/en/conservation/plant_grow_fly/
Teaming With Wildlife Coalition	http://www.teaming.com/
Iowa Teaming With Wildlife Coalition	http://www.teaming.com/state/iowa
Wildlife Management Institute	http://wildlifemanagementinstitute.org/

Non-governmental Fish and Wildlife Conservation and Scientific Organizations in Iowa

Organization Name	Website
American Ornithologists' Union Check-List of North American Birds	http://www.aou.org/checklist/north/
National Audubon Society Important Bird Areas	http://www.audubon.org/bird/iba
Iowa Audubon Society Important Bird Areas	http://www.iowaaudubon.org/IBA/
Iowa Audubon	http://www.iowaaudubon.org
Iowa Academy of Science	http://www.scienceiniowa.org/
American Fisheries Society	http://fisheries.org/
Iowa Chapter of the American Fisheries Society	http://iowa.fisheries.org/
Iowa Association of Naturalists	http://www.iowanaturalists.org/
Iowa Association of Wildlife Rehabilitators	
Blank Park Zoo	http://www.blankparkzoo.com/
Iowa Conservation Education Coalition	http://www.iowaee.org/
Ducks Unlimited	http://www.ducks.org/

Organization Name	Website
Hawkeye Fly Fishing Association	http://www.hawkeyeflyfishing.com/
Iowa Division of the Izaak Walton League of America	http://iowaikes.org/
Iowa Native Plant Society	http://iowanativeplants.org/index.php
Iowa Natural Heritage Foundation	http://www.inhf.org/
Iowa Odonata Survey	www.iowaodes.org
Iowa Prairie Network	http://www.iowaprairienetwork.org/
Iowa Wildlife Center	
Loess Hills Alliance	http://loesshillsalliance.com/
Loess Hills Preservation Society	http://loesshps.org/
Macbride Raptor Project	http://recserv.uiowa.edu/mrp
National Wildlife Federation	www.nwf.org
Iowa Wildlife Federation (Iowa Affiliate of the National Wildlife Federation)	http://iawildlife.org/
National Wild Turkey Federation - Iowa	http://www.nwtf.org/about/state/iowa
NatureServe	http://www.natureserve.org/
Odonata Central, also hosts Dragonfly Society of the America's webpage	http://www.odonatacentral.org
Pheasants Forever - Iowa	http://www.iowapf.net/
Quail Forever	http://quailforever.org/
Reiman Gardens at Iowa State University	http://www.reimangardens.com/
Iowa Butterfly Survey Network (hosted by Reiman Gardens)	http://www.reimangardens.com/collections/insects/iowa-butterfly-survey-network/
Ruffed Grouse Society	http://www.ruffedgrousesociety.org/
Safari Club International - Iowa	http://iowasci.com/
Saving Our Avian Resources	http://www.soarraptors.org/
Sierra Club - Iowa	http://www.sierraclub.org/iowa
Society for the Study of Amphibians and Reptiles	https://ssarherps.org/
Southern Iowa Oak Savanna Alliance	http://www.siosa.org/
The Nature Conservancy - Iowa	http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/iowa/index.htm?intc=nature.tnav.where.list
Trout Unlimited – Iowa Chapter	http://www.iadriftless.org/
The Wildlife Society	http://wildlife.org/
Iowa Chapter of The Wildlife Society	http://iowatws.org/
Whiterock Conservancy	http://whiterockconservancy.org/

Websites

The following websites provide information about Iowa species (occurrence records, life history information, checklists, taxonomic order and nomenclature, etc.)

Organization Name	Website
General	
Iowa Academy of Science	http://www.scienceiniowa.org/
NatureServe Explorer	http://explorer.natureserve.org/
Amphibians and Reptiles	
Society for the Study of Amphibians and Reptiles	https://ssarherps.org/
Herpnet – Iowa and Minnesota	(As of printing time, this site is changing its web address)
Birds	
American Ornithologists' Union Check-List of North American Birds	http://www.aou.org/checklist/north/
Iowa Ornithologists' Union	http://iowabirds.org/
Butterflies & Moths	
North American Butterfly Association's Checklist of North American Butterflies Occurring North of Mexico	http://www.naba.org/pubs/enames2.html
Iowa Butterfly Survey Network (hosted by Reiman Gardens)	http://www.reimangardens.com/collections/insects/iowa-butterfly-survey-network/
Poweshiek Skipper Project	http://www.poweshiekskipper.org/biodiversity/biodiversityhome.html
Insects of Iowa	http://www.insectsofiowa.org/
Crayfish	
BioNet	https://programs.iowadnr.gov/bionet/
Dragonflies and Damselflies	
Iowa Odonata Survey	www.iowaodes.org
Odonata Central, also hosts Dragonfly Society of the America's webpage	http://www.odonatacentral.org
BioNet	https://programs.iowadnr.gov/bionet/
Insects of Iowa	http://www.insectsofiowa.org/
Fish	
BioNet	https://programs.iowadnr.gov/bionet/
Fish Atlas (Aquatic GAP)	http://maps.gis.iastate.edu/iris/fishatlas/
Mammals	
Smithsonian Institution's Mammals of the World Online Database	http://vertebrates.si.edu/msw/mswcfapp/msw/index.cfm
Mussels	
BioNet	https://programs.iowadnr.gov/bionet/
Terrestrial Snails	
Poweshiek Skipper Project	http://www.poweshiekskipper.org/biodiversity/biodiversityhome.html
Field Museum of Natural History's Mollusk Collection	http://www.fieldmuseum.org/node/5011

Plans and Strategies

The following strategic plans, which were developed by wildlife conservation agencies, organizations or partnerships are relevant to the implementation of various aspects of the Iowa Wildlife Action Plan.

Organization/Plan Name	Website
Iowa Plans	
Iowa's Forest Action Plan	http://www.iowadnr.gov/Environment/Forestry/ForestryLinks/Publications/IowaForestActionPlan.aspx
State Conservation and Outdoor Recreation Plan	http://www.iowadnr.gov/InsideDNR/GrantsOtherFunding/StateConservationRecPlan.aspx
Iowa Water Trails Plan	http://www.iowadnr.gov/Recreation/CanoeingKayaking/WaterTrailDevelopmentTools/StatewidePlan.aspx
Iowa's Wetland Action Plan	http://www.iowadnr.gov/Environment/WaterQuality/WaterMonitoring/Wetlands.aspx
Comprehensive Conservation Plans for National Wildlife Refuges in Iowa	http://www.fws.gov/midwest/planning/PlansByState/iowa.html
Regional Plans	
Bird Joint Venture Plans	
Prairie Pothole Joint Venture (PPJV) Implementation Plan	http://ppjv.org/resources/implementation-plan
Upper Mississippi River and Great Lakes Region (UMRJV) Implementation Plan	http://uppermissisgreatlakesjv.org/Plans.htm (Habitat Conservation Strategies for Landbirds, Shorebirds, Waterfowl and Waterbirds within this JV are also available at this site)
The Nature Conservancy Ecoregional Assessments	http://www.conservationgateway.org/ConservationPlanning/SettingPriorities/EcoregionalReports/Pages/EastData.aspx
1. Central Tallgrass Prairie	Ecoregional Assessments and reports for each of the three ecoregions in Iowa can be downloaded from the Conservation Gateway's Ecoregional Assessment Status Tool (EAST)
2. Northern Tallgrass Prairie	
3. Prairie Forest Border	
Partners in Flight Physiographic Area Plans	http://www.partnersinflight.org/bcps/pifplans.htm
1. Dissected Till Plains - Physiographic Region #32	http://www.partnersinflight.org/bcps/pl_32sum.htm
2. Northern Tallgrass Prairie, Physiographic Region #40	http://www.partnersinflight.org/bcps/pl_40sum.htm
3. Upper Great Lakes Plain, Physiographic Region #16	http://www.partnersinflight.org/bcps/pl_16sum.htm
National/Continental Plans	
North American Waterfowl Management Plan	http://www.fws.gov/birds/management/bird-management-plans/north-american-waterfowl-management-plan.php
United States Shorebird Conservation Plan	http://www.shorebirdplan.org/
United States Waterbird Conservation Plan	http://www.waterbirdconservation.org/nawcp.html
North American Landbird Conservation Plan	http://www.partnersinflight.org/cont_plan/
North American Monarch Conservation Plan	http://www.cec.org/Page.asp?PageID=122&ContentID=2783
National for Fish, Wildlife and Plants Climate Change Adaptation Strategy	http://www.wildlifeadaptationstrategy.gov/