Accipiter gentilis - (Linnaeus, 1758)
Northern Goshawk
Taxonomic Status: Accepted
Related ITIS Name(s): *Accipiter gentilis* (Linnaeus, 1758) (TSN 175300)
French Common Names: autour des palombes
Spanish Common Names: Gavilán Azor
Unique Identifier: ELEMENT_GLOBAL.2.104351
Element Code: ABNKC12060
Informal Taxonomy: Animals, Vertebrates - Birds - Other Birds


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Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Aves	Accipitriformes	Accipitridae	Accipiter

Genus Size: D - Medium to large genus (21+ species)

Check this box to expand all report sections: ☐

Concept Reference
Expand

Conservation Status
Collapse

NatureServe Status

Global Status: G5
Global Status Last Reviewed: 30Nov1999
Global Status Last Changed: 22Nov1996
Rounded Global Status: G5 - Secure
Reasons: Relatively abundant and widespread, Holarctic; population trends are difficult to determine; no hard evidence of a significant decline in recent decades, but probably declining in some areas primarily as a result of habitat alteration (especially logging), which can be expected to continue; effectiveness of forest management guidelines in providing adequate protection remains to be determined.
Nation: United States
National Status: N4B,N4N (05Jan1997)
Nation: Canada

National Status: N5 (06May2013)

U.S. & Canada State/Province Status	
United States	Alaska (S4), Arizona (S3), California (S3), Colorado (S3B), Connecticut (S4B), Delaware (SNA), Idaho (S3), Illinois (SNA), Indiana (SNA), Iowa (SNA), Kansas (SNA), Kentucky (SNA), Maine (S3?B,S3?N), Maryland (S1B), Massachusetts (S3), Michigan (S3), Minnesota (SNRB,SNRN), Montana (S3), Navajo Nation (S3), Nebraska (SNRN), Nevada (S2), New Hampshire (S3), New Jersey (S1B,S3N), New Mexico (S2B,S3N), New York (S3S4B,S3N), North Carolina (SUB), North Dakota (SNA), Ohio (SNRN), Oklahoma (S2N), Oregon (S3), Pennsylvania (S2S3B,S3N), Rhode Island (S1B,S1N), South Carolina (SNA), South Dakota (S3B,S2N), Tennessee (S2N), Utah (S4), Vermont (S2B,S3N), Washington (S2S3B,S3N), West Virginia (S1B,S1N), Wisconsin (S2B,S2N), Wyoming (S2B,S3N)
Canada	Alberta (S3S4), British Columbia (S4B,S4N), Labrador (S3?), Manitoba (S4), New Brunswick (S4), Newfoundland Island (S3B), Northwest Territories (S5), Nova Scotia (S3S4), Nunavut (SNR), Ontario (S4), Prince Edward Island (S4), Quebec (S4), Saskatchewan (S4B,S4M,S3N), Yukon Territory (S4)

Other Statuses

Implied Status under the U.S. Endangered Species Act (USESA): PS
Comments on USESA: USFWS found that listing the population in the contiguous U.S. west of the 100th meridian as threatened or endangered was not warranted (Federal Register 63:35183-35184, 29 June 1998). USFWS (Federal Register, 3 November 2009) proposed to list the British Columbia distinct population segment (DPS) of subspecies *laingi* as threatened, except on the Queen Charlotte Islands (a significant portion of the DPS's range), where they proposed to list the goshawk as endangered.
Implied Status under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC): T,NAR
Comments on COSEWIC: The Northern Goshawk *atricapillus* subspecies was designated Not At Risk in April 1995. The Northern Goshawk *laingi* subspecies was designated as Special Concern in April 1995. Status re-examined and designated Threatened in November 2000 and May 2013.
IUCN Red List Category: LC - Least concern
Convention on International Trade in Endangered Species Protection Status (CITES): Appendix II

NatureServe Global Conservation Status Factors

Range Extent: >2,500,000 square km (greater than 1,000,000 square miles)
Range Extent Comments: BREEDING: North America: western and central Alaska to northeastern Manitoba, Labrador, and Newfoundland, south to central California, southern Arizona, eastern foothills of Rockies, central Alberta, southern Manitoba, central Michigan, Pennsylvania, northwestern Connecticut, and in the Appalachians south to West Virginia and Maryland; locally in highlands of Mexico to Jalisco and Guerrero. Eurasia: British Isles, Scandinavia, northern Russia, and northern Siberia south to the Mediterranean, Asia Minor, Iran, the Himalayas, eastern China, and Japan (Squires and Reynolds 1997, AOU 1998). NON-BREEDING: throughout breeding range and irregularly southward (Squires and Reynolds 1997, AOU 1998). In some years there are large flights (irruptions) south beyond the usual wintering range. These excursions are prompted by changing conditions on the northern breeding grounds (Mueller et al. 1977). Recorded occasionally as far south as Arkansas, Louisiana, Kentucky, Alabama, and North Carolina (Adkisson 1990). The three subspecies in the U.S. have the following ranges: 1) ATRICAPILLUS: Alaska, Canada, eastern U.S., and the more northerly mountains of the west. 2) LAINGI: islands off the Canadian Pacific coast. 3) APACHE: southern Arizona, New Mexico, and the mountains of northwestern Mexico (Jones 1979).

Number of Occurrences: 81 to >300
Number of Occurrences Comments: Unknown, but likely to be more than 300.

Population Size: 10,000 - 1,000,000 individuals
Population Size Comments: Relatively common in the main part of its range.

Overall Threat Impact: Medium
Overall Threat Impact Comments: HABITAT: Timber harvest is the principal threat to breeding populations (Squires and Reynolds 1997). In addition to the relatively long-term impacts of removing nest trees and degrading habitat by reducing stand

density and canopy cover, logging activities conducted near nests during the incubation and nestling periods can have an immediate impact: nest failure due to abandonment (Boal and Mannan 1994, Squires and Reynolds 1997). Following canopy reduction by logging, goshawks are often replaced by other raptors including Red-tailed Hawk (BUTEO JAMAICENSIS), Great Horned Owl (BUBO VIRGINIANUS), and Long-eared Owl (ASIO OTUS; Crocker-Bedford 1990, Erdman et al. 1998). Fire suppression, grazing, and insect and tree disease outbreaks can result in the deterioration or loss of nesting habitat (Graham et al. 1999). PREDATION: The incursion of Great Horned Owls is especially significant as they prey on both adult and nestling goshawks (Boal and Mannan 1994, Erdman et al. 1998, Rohner and Doyle 1992). Other known or suspected predators include martens (MARTES AMERICANA), fishers (MARTES PENNANTI), and wolverines (GULO GULO; Doyle 1995, Erdman et al. 1998, Graham et al. 1999, Paragi and Wholecheese 1994). PESTICIDES: Presently, pesticides do not appear to be a major threat, presumably since agricultural landscapes are seldom used. In the early 1970s, pesticide levels in tested birds were low, and egg thinning due to DDT contamination had not occurred in most populations (Snyder et al. 1973). In addition, population trends derived from counts of migrants at Hawk Mountain, Pennsylvania, were generally upward during DDT period, 1946-1972 (Squires and Reynolds 1997). HUMAN DISTURBANCE: Although often persecuted in the past (Bent 1937), intentional shooting or trapping is no longer considered a significant source of mortality. The impact of falconry is generally unknown; however, in northern Wisconsin falconers removed an estimated 5 percent of young annually from monitored nests during a 21-year period (Erdman et al. 1998). DISEASE: Bacterial and fungal diseases have been observed, as have infestations of both external and internal parasites (summarized in Squires and Reynolds 1997). Infections of the fungus ASPERGILLUS were found to be more prevalent in migrants captured in Minnesota during invasion years than non-invasion years, possibly due to stress (Redig et al. 1980).

Short-term Trend: Relatively stable (=10% change)
Short-term Trend Comments: Trends are difficult to determine due to the paucity of historic quantitative data and because of biases inherent in the various methodologies used to track bird populations. Nesting range in the eastern U.S. is currently expanding as second-growth forests mature (Squires and Reynolds 1997). In the west, clearcut logging of old-growth forests, fire suppression, and catastrophic fire are postulated to be reducing habitat and thus populations, especially that of the subspecies LAINGI (USFWS 1994). However, conclusive data supporting the purported decline in the western U.S. are lacking (USFWS 1997, Kennedy 1997). Christmas Bird Count (CBC) data (1959-1988; Sauer et al. 1996), North American Breeding Bird Survey (BBS) data (1966-1996; Sauer et al. 1997), and counts of migrants in the eastern U.S. (1972-1987; Titus and Fuller 1990) do not indicate any significant changes in populations. Data derived from CBC and BBS are difficult to interpret due to low sample sizes and the possibility that birds counted may not be a random sample of the breeding population. Counts from migration monitoring stations are complicated by population fluctuations resulting from periodic invasions of large numbers of birds (Bednarz et al. 1990, Titus and Fuller 1990, USFWS 1998).

Long-term Trend:
Long-term Trend Comments: Bent (1937) reported a population decline in Pennsylvania and implied that the extinction of the passenger pigeon (ECTOPISTES MIGRATORIUS) played a role. However, extensive logging likely contributed to the decline in Pennsylvania and other eastern states (Squires and Reynolds 1997).

Other NatureServe Conservation Status Information

Inventory Needs: Better estimates of population size and distribution of this species are needed, especially on nonfederal lands. Good baseline data is needed in areas expected to experience increased logging of mature forests in next decade.

Protection Needs: Protection needs are still being debated among experts. Critical habitat needs better definition for the various parts of the range before protection needs can be clearly detailed. However, in general, protection of large, mature to old-growth forest tracts should be beneficial.

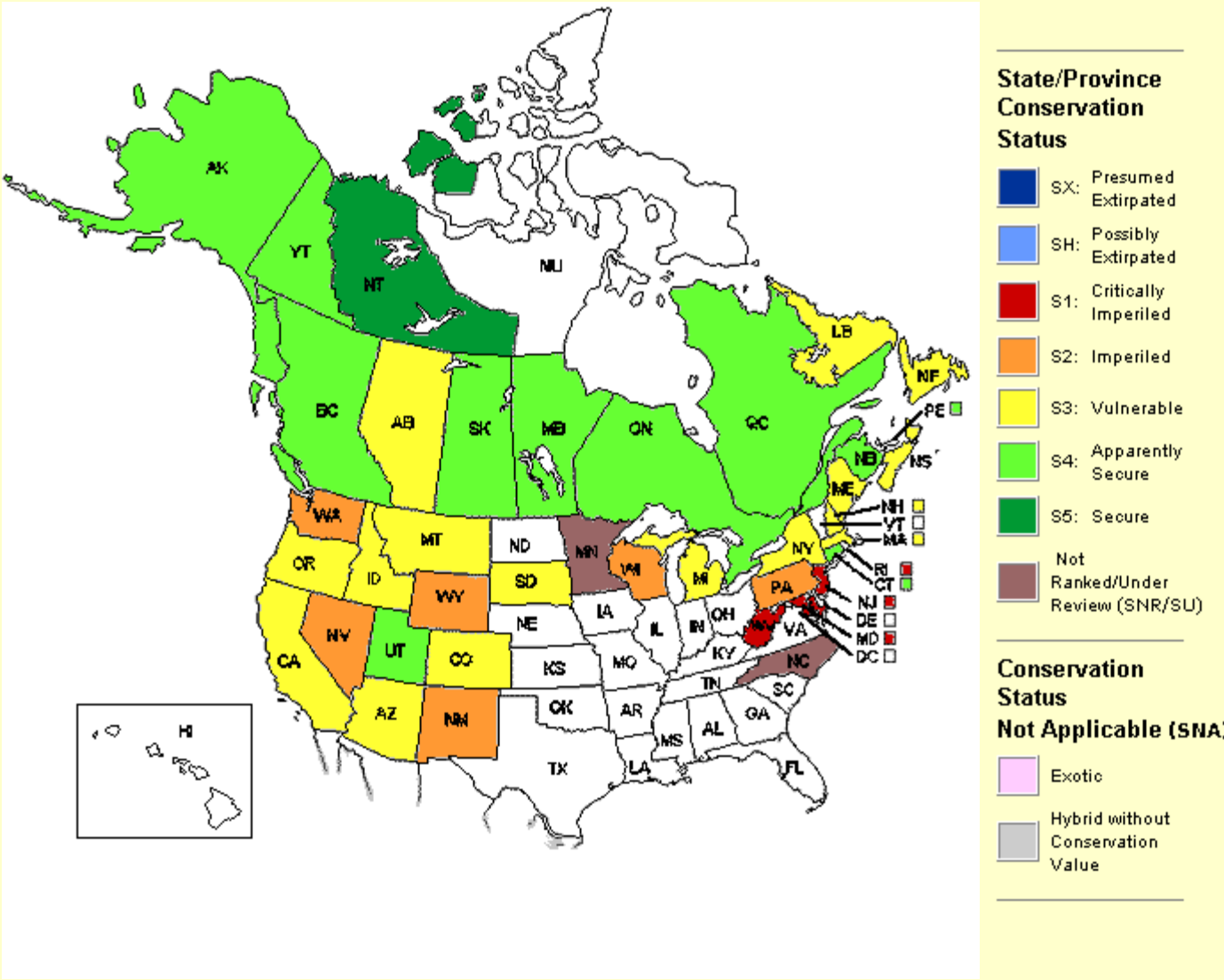
Distribution

Collapse

Global Range: (>2,500,000 square km (greater than 1,000,000 square miles)) BREEDING: North America: western and central Alaska to northeastern Manitoba, Labrador, and Newfoundland, south to central California, southern Arizona, eastern foothills of Rockies, central Alberta, southern Manitoba, central Michigan, Pennsylvania, northwestern Connecticut, and in the Appalachians south to West Virginia and Maryland; locally in highlands of Mexico to Jalisco and Guerrero. Eurasia: British Isles, Scandinavia, northern Russia, and northern Siberia south to the Mediterranean, Asia Minor, Iran, the Himalayas, eastern China, and Japan (Squires and Reynolds 1997, AOU 1998). NON-BREEDING: throughout breeding range and irregularly

southward (Squires and Reynolds 1997, AOU 1998). In some years there are large flights (irruptions) south beyond the usual wintering range. These excursions are prompted by changing conditions on the northern breeding grounds (Mueller et al. 1977). Recorded occasionally as far south as Arkansas, Louisiana, Kentucky, Alabama, and North Carolina (Adkisson 1990). The three subspecies in the U.S. have the following ranges: 1) ATRICAPILLUS: Alaska, Canada, eastern U.S., and the more northerly mountains of the west. 2) LAINGI: islands off the Canadian Pacific coast. 3) APACHE: southern Arizona, New Mexico, and the mountains of northwestern Mexico (Jones 1979).

U.S. States and Canadian Provinces



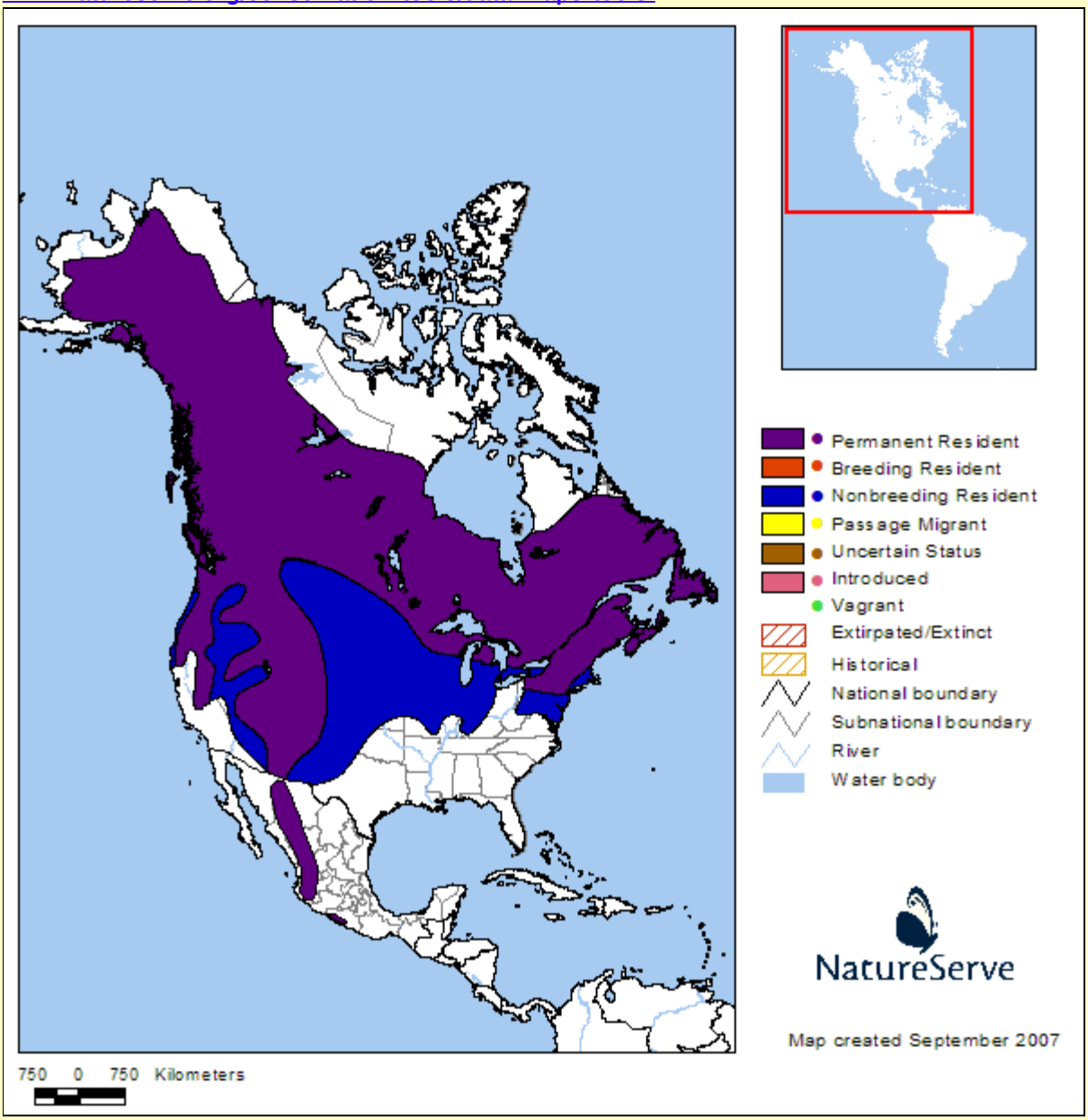
NOTE: The maps for birds represent the breeding status by state and province. In some jurisdictions, the subnational statuses for common species have not been assessed and the status is shown as not-assessed (SNR). In some jurisdictions, the subnational status refers to the status as a non-breeder; these errors will be corrected in future versions of these maps. A species is not shown in a jurisdiction if it is not known to breed in the jurisdiction or if it occurs only accidentally or casually in the jurisdiction. Thus, the species may occur in a jurisdiction as a seasonal non-breeding resident or as a migratory transient but this will not be indicated on these maps. See other maps on this web site that depict the Western Hemisphere ranges of these species at all seasons of the year.

Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	AK, AZ, CA, CO, CT, DE, IA, ID, IL, IN, KS, KY, MA, MD, ME, MI, MN, MT, NC, ND, NE, NH, NJ, NM, NN, NV, NY, OH, OK, OR, PA, RI, SC, SD, TN, UT, VT, WA, WI, WV, WY
Canada	AB, BC, LB, MB, NB, NF, NS, NT, NU, ON, PE, QC, SK, YT

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: NatureServe, 2002; WILDSPACETM 2002

U.S. Distribution by County	
State	**County Name (FIPS Code)**
AK	Juneau (02110), Ketchikan Gateway (02130), Prince of Wales-Outer Ketchikan (CA) (02201), Sitka (02220), Skagway-Hoonah-Angoon (CA) (02232), Wrangell-Petersburg (CA) (02280)
AZ	Apache (04001), Cochise (04003), Coconino (04005), Gila (04007), Graham (04009), Greenlee (04011), Mohave (04015), Navajo (04017), Pima (04019), Santa Cruz (04023), Yavapai (04025)
CA	Alpine (06003)*, Butte (06007), Calaveras (06009), El Dorado (06017), Fresno (06019), Glenn (06021), Humboldt (06023)*, Inyo (06027), Kern (06029), Lake (06033), Lassen (06035), Mariposa (06043), Mendocino (06045), Modoc (06049), Mono (06051), Nevada (06057), Placer (06061), Plumas (06063), Shasta (06089), Sierra (06091), Siskiyou (06093), Tehama (06103), Trinity (06105), Tulare (06107), Tuolumne (06109)
ID	Ada (16001), Adams (16003), Bannock (16005), Bear Lake (16007), Blaine (16013), Boise (16015),

	Bonner (16017), Bonneville (16019), Boundary (16021), Camas (16025), Caribou (16029), Cassia (16031), Clark (16033), Clearwater (16035), Custer (16037), Elmore (16039), Franklin (16041), Fremont (16043), Gem (16045), Idaho (16049), Kootenai (16055), Latah (16057), Lemhi (16059), Lincoln (16063), Madison (16065), Nez Perce (16069), Owyhee (16073), Power (16077), Shoshone (16079), Teton (16081), Twin Falls (16083), Valley (16085), Washington (16087)
MD	Allegany (24001), Garrett (24023)
MI	Alcona (26001), Alger (26003), Antrim (26009), Bay (26017), Benzie (26019), Charlevoix (26029)*, Cheboygan (26031), Chippewa (26033), Clare (26035), Crawford (26039), Delta (26041), Dickinson (26043), Gogebic (26053), Grand Traverse (26055), Iosco (26069), Iron (26071), Kalamazoo (26077), Kalkaska (26079), Lake (26085), Luce (26095), Mackinac (26097), Manistee (26101), Marquette (26103), Mason (26105), Menominee (26109), Midland (26111), Montcalm (26117), Muskegon (26121), Newaygo (26123), Oceana (26127), Ogemaw (26129), Ontonagon (26131), Oscoda (26135), Otsego (26137), Schoolcraft (26153), Tuscola (26157), Wexford (26165)
MN	Aitkin (27001)*, Anoka (27003)*, Becker (27005), Beltrami (27007), Carlton (27017), Carver (27019)*, Cass (27021), Clearwater (27029), Cook (27031), Dakota (27037)*, Hennepin (27053)*, Hubbard (27057), Itasca (27061), Koochiching (27071), Lake (27075), Lake of the Woods (27077)*, Morrison (27097)*, Pine (27115), Ramsey (27123)*, Roseau (27135)*, Scott (27139)*, Sherburne (27141)*, St. Louis (27137), Wadena (27159), Wright (27171)*
MT	Beaverhead (30001), Broadwater (30007), Carbon (30009), Carter (30011), Deer Lodge (30023), Fergus (30027), Flathead (30029), Gallatin (30031), Glacier (30035), Granite (30039), Jefferson (30043), Judith Basin (30045), Lake (30047), Lewis and Clark (30049), Liberty (30051), Lincoln (30053), Madison (30057), Meagher (30059), Mineral (30061), Missoula (30063), Park (30067), Powder River (30075), Powell (30077), Ravalli (30081), Rosebud (30087), Sanders (30089), Silver Bow (30093), Stillwater (30095), Sweet Grass (30097), Teton (30099), Wheatland (30107)
NH	Carroll (33003), Rockingham (33015)
NJ	Cape May (34009), Hunterdon (34019), Morris (34027), Passaic (34031), Somerset (34035), Sussex (34037), Warren (34041)
NM	Bernalillo (35001), Catron (35003), Cibola (35006), Dona Ana (35013), Grant (35017), Hidalgo (35023), Lincoln (35027), Los Alamos (35028), Mckinley (35031), Mora (35033), Otero (35035), Rio Arriba (35039), San Juan (35045), San Miguel (35047), Sandoval (35043), Sierra (35051), Socorro (35053), Taos (35055), Torrance (35057)
NV	Elko (32007), Washoe (32031)
OR	Baker (41001), Clackamas (41005), Crook (41013), Deschutes (41017), Douglas (41019), Grant (41023), Harney (41025), Jackson (41029), Jefferson (41031), Klamath (41035), Lane (41039), Malheur (41045), Marion (41047), Umatilla (41059), Union (41061), Wallowa (41063), Wasco (41065), Wheeler (41069)
PA	Berks (42011), Cameron (42023), Centre (42027), Clearfield (42033), Clinton (42035), Crawford (42039), Elk (42047), Forest (42053), Huntingdon (42061), Jefferson (42065), Lackawanna (42069)*, Luzerne (42079), Lycoming (42081)*, McKean (42083), Mifflin (42087), Monroe (42089)*, Pike (42103)*, Potter (42105), Schuylkill (42107), Sullivan (42113), Susquehanna (42115), Tioga (42117), Union (42119), Warren (42123), Wayne (42127)*
RI	Providence (44007)
SD	Custer (46033), Harding (46063), Lawrence (46081), Meade (46093), Pennington (46103)
UT	Beaver (49001)*, Box Elder (49003), Cache (49005), Carbon (49007), Daggett (49009), Duchesne (49013), Emery (49015), Garfield (49017), Grand (49019), Iron (49021), Juab (49023), Kane (49025), Millard (49027)*, Morgan (49029)*, Piute (49031), Rich (49033), Salt Lake (49035), San Juan (49037), Sanpete (49039), Sevier (49041), Summit (49043), Tooele (49045)*, Uintah (49047), Utah (49049), Wasatch (49051), Washington (49053), Wayne (49055), Weber (49057)*
VT	Essex (50009)
WA	Asotin (53003)+*, Benton (53005)+*, Chelan (53007)+*, Clallam (53009)+*, Clark (53011)+*, Columbia (53013)+*, Cowlitz (53015)+*, Ferry (53019)+*, Garfield (53023)+*, Grays Harbor (53027)+*, Jefferson (53031)+*, King (53033)+*, Kittitas (53037)+*, Klickitat (53039)+*, Lewis (53041)+*, Lincoln (53043)+*, Mason (53045)+*, Okanogan (53047)+*, Pacific (53049)+*, Pend Oreille (53051)+*, Pierce (53053)+*, Skagit (53057)+*, Skamania (53059)+*, Snohomish (53061)+*, Spokane (53063)+*, Stevens (53065)+*, Whatcom (53073)+*, Whitman (53075)+*, Yakima (53077)+*
WI	Ashland (55003), Barron (55005), Bayfield (55007), Burnett (55013), Clark (55019), Door (55029), Douglas (55031), Florence (55037), Forest (55041), Iron (55051), Jackson (55053), Juneau (55057),

	Langlade (55067), Lincoln (55069), Marathon (55073), Marinette (55075), Monroe (55081), Oconto (55083), Oneida (55085), Portage (55097), Price (55099), Rusk (55107), Sawyer (55113), Shawano (55115), Sheboygan (55117), Taylor (55119), Vilas (55125), Washburn (55129), Waushara (55137), Wood (55141)
WV	Hampshire (54027), Pocahontas (54075), Randolph (54083), Tucker (54093), Webster (54101)
WY	Albany (56001), Big Horn (56003), Campbell (56005), Carbon (56007), Converse (56009), Crook (56011), Fremont (56013), Goshen (56015), Hot Springs (56017), Johnson (56019), Laramie (56021), Lincoln (56023), Natrona (56025), Niobrara (56027), Park (56029), Platte (56031), Sheridan (56033), Sublette (56035), Sweetwater (56037), Teton (56039), Uinta (56041), Washakie (56043), Weston (56045)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
01	Saco (01060002)+, Merrimack (01070006)+, Narragansett (01090004)+, Quinebaug (01100001)+
02	Rondout (02020007)+, Hackensack-Passaic (02030103)+, Raritan (02030105)+, Lackawaxen (02040103)+*, Middle Delaware-Mongaup-Brodhead (02040104)+, Middle Delaware-Musconetcong (02040105)+, Schuylkill (02040203)+, Cohansey-Maurice (02040206)+, Upper Susquehanna-Tunkhannock (02050106)+, Upper Susquehanna-Lackawanna (02050107)+, Upper West Branch Susquehanna (02050201)+, Sinnemahoning (02050202)+, Middle West Branch Susquehanna (02050203)+, Bald Eagle (02050204)+, Pine (02050205)+, Lower West Branch Susquehanna (02050206)+, Lower Susquehanna-Penns (02050301)+, Upper Juniata (02050302)+, Lower Juniata (02050304)+, South Branch Potomac (02070001)+, North Branch Potomac (02070002)+, Cacapon-Town (02070003)+
04	Baptism-Brule (04010101)+, Beaver-Lester (04010102)+*, St. Louis (04010201)+, Cloquet (04010202)+*, Beartrap-Nemadji (04010301)+, Bad-Montreal (04010302)+, Black-Presque Isle (04020101)+, Ontonagon (04020102)+, Sturgeon (04020104)+, Betsy-Chocolay (04020201)+, Tahquamenon (04020202)+, Waiska (04020203)+, Lake Superior (04020300)+*, Manitowoc-Sheboygan (04030101)+, Door-Kewaunee (04030102)+, Oconto (04030104)+, Peshtigo (04030105)+, Brule (04030106)+, Menominee (04030108)+, Cedar-Ford (04030109)+, Tacoosh-Whitefish (04030111)+, Fishdam-Sturgeon (04030112)+, Wolf (04030202)+, St. Joseph (04050001)+, Pere Marquette-White (04060101)+, Muskegon (04060102)+, Manistee (04060103)+, Betsie-Platte (04060104)+, Boardman-Charlevoix (04060105)+, Manistique (04060106)+, Carp-Pine (04070002)+, Lone Lake-Ocqueoc (04070003)+, Cheboygan (04070004)+, Black (04070005)+, Au Sable (04070007)+, Au Gres-Rifle (04080101)+, Kawkawlin-Pine (04080102)+, Tittabawassee (04080201)+, Cass (04080205)+, St. Francois River (04150500)+
05	Upper Allegheny (05010001)+, Middle Allegheny-Tionesta (05010003)+, Clarion (05010005)+, Middle Allegheny-Redbank (05010006)+, Tygart Valley (05020001)+, Cheat (05020004)+, Youghiogheny (05020006)+, Greenbrier (05050003)+, Gauley (05050005)+
07	Mississippi Headwaters (07010101)+, Leech Lake (07010102)+, Prairie-Willow (07010103)+, Elk-Nokasippi (07010104)+*, Crow Wing (07010106)+, Long Prairie (07010108)+*, Crow (07010204)+*, South Fork Crow (07010205)+*, Twin Cities (07010206)+*, Lower Minnesota (07020012)+*, Upper St. Croix (07030001)+, Namekagon (07030002)+, Kettle (07030003)+, Lower St. Croix (07030005)+, Black (07040007)+, Upper Chippewa (07050001)+, Flambeau (07050002)+, South Fork Flambeau (07050003)+, Jump (07050004)+, Lower Chippewa (07050005)+, Red Cedar (07050007)+, Upper Wisconsin (07070001)+, Lake Dubay (07070002)+, Castle Rock (07070003)+
09	Red Lakes (09020302)+, Two Rivers (09020312)+*, Roseau (09020314)+*, Rainy Headwaters (09030001)+, Vermilion (09030002)+, Rainy Lake (09030003)+*, Little Fork (09030005)+, Big Fork (09030006)+, Lake of the Woods (09030009)+*, St. Marys (09040001)+
10	Red Rock (10020001)+, Beaverhead (10020002)+, Ruby (10020003)+, Big Hole (10020004)+, Jefferson (10020005)+, Madison (10020007)+, Gallatin (10020008)+, Upper Missouri (10030101)+, Upper Missouri-Dearborn (10030102)+, Smith (10030103)+, Sun (10030104)+, Marias (10030203)+, Teton (10030205)+, Arrow (10040102)+, Judith (10040103)+, Upper Musselshell (10040201)+, Box Elder (10040204)+, Sage (10050006)+, Yellowstone Headwaters (10070001)+, Upper Yellowstone (10070002)+, Shields (10070003)+, Stillwater (10070005)+, Clarks Fork

	Yellowstone (10070006)+, Upper Wind (10080001)+, Little Wind (10080002)+, Popo Agie (10080003)+, Upper Bighorn (10080007)+, Nowood (10080008)+, Greybull (10080009)+, Big Horn Lake (10080010)+, North Fork Shoshone (10080012)+, South Fork Shoshone (10080013)+, Shoshone (10080014)+, Little Bighorn (10080016)+, Upper Tongue (10090101)+, Lower Tongue (10090102)+, Middle Fork Powder (10090201)+, Upper Powder (10090202)+, South Fork Powder (10090203)+, Crazy Woman (10090205)+, Clear (10090206)+, Middle Powder (10090207)+, Lower Yellowstone-Sunday (10100001)+, Rosebud (10100003)+, Upper Little Missouri (10110201)+, Boxelder (10110202)+, Angostura Reservoir (10120106)+, Beaver (10120107)+, Middle Cheyenne-Spring (10120109)+, Rapid (10120110)+, Middle Cheyenne-Elk (10120111)+, Upper Belle Fourche (10120201)+, Lower Belle Fourche (10120202)+, Redwater (10120203)+, Upper Moreau (10130305)+, Niobrara Headwaters (10150002)+, Upper North Platte (10180002)+, Pathfinder-Seminoe Reservoirs (10180003)+, Medicine Bow (10180004)+, Little Medicine Bow (10180005)+, Sweetwater (10180006)+, Middle North Platte-Casper (10180007)+, Glendo Reservoir (10180008)+, Middle North Platte-Scotts Bluff (10180009)+, Upper Laramie (10180010)+, Lower Laramie (10180011)+, Crow (10190009)+
11	Mora (11080004)+
13	Upper Rio Grande (13020101)+, Rio Chama (13020102)+, Rio Grande-Santa Fe (13020201)+, Jemez (13020202)+, Rio Grande-Albuquerque (13020203)+, Arroyo Chico (13020205)+, Rio San Jose (13020207)+, Elephant Butte Reservoir (13020211)+, El Paso-Las Cruces (13030102)+, Mimbres (13030202)+, Western Estancia (13050001)+, Tularosa Valley (13050003)+, Salt Basin (13050004)+, Pecos headwaters (13060001)+, Arroyo Del Macho (13060005)+, Gallo Arroyo (13060006)+, Rio Hondo (13060008)+, Rio Penasco (13060010)+
14	Lower Dolores (14030004)+, Upper Colorado-Kane Springs (14030005)+, Upper Green (14040101)+, New Fork (14040102)+, Upper Green-Slate (14040103)+, Big Sandy (14040104)+, Bitter (14040105)+, Upper Green-Flaming Gorge Reservoir (14040106)+, Blacks Fork (14040107)+, Muddy (14040108)+, Vermilion (14040109)+, Great Divide closed basin (14040200)+, Little Snake (14050003)+, Muddy (14050004)+, Ashley-Brush (14060002)+, Duchesne (14060003)+, Strawberry (14060004)+, Lower Green-Desolation Canyon (14060005)+, Willow (14060006)+, Price (14060007)+, San Rafael (14060009)+, Upper Lake Powell (14070001)+, Muddy (14070002)+, Fremont (14070003)+, Escalante (14070005)+, Lower Lake Powell (14070006)+, Paria (14070007)+, Middle San Juan (14080105)+, Chaco (14080106)+, Lower San Juan-Four Corners (14080201)+, Montezuma (14080203)+, Chinle (14080204)+
15	Lower Colorado-Marble Canyon (15010001)+, Grand Canyon (15010002)+, Kanab (15010003)+, Havasu Canyon (15010004)+, Upper Virgin (15010008)+, Fort Pierce Wash (15010009)+, Lower Virgin (15010010)+, Little Colorado headwaters (15020001)+, Upper Little Colorado (15020002)+, Carrizo Wash (15020003)+, Zuni (15020004)+, Silver (15020005)+, Upper Puerco (15020006)+, Middle Little Colorado (15020008)+, Chevelon Canyon (15020010)+, Corn-Oraibi (15020012)+, Canyon Diablo (15020015)+, Lower Little Colorado (15020016)+, Moenkopi Wash (15020018)+, Big Sandy (15030201)+, Burro (15030202)+, Upper Gila (15040001)+, Upper Gila-Mangas (15040002)+, Animas Valley (15040003)+, San Francisco (15040004)+, Upper Gila-San Carlos Reservoir (15040005)+, San Simon (15040006)+, Willcox Playa (15050201)+, Upper San Pedro (15050202)+, Lower San Pedro (15050203)+, Upper Santa Cruz (15050301)+, Rillito (15050302)+, Black (15060101)+, Upper Salt (15060103)+, Carrizo (15060104)+, Tonto (15060105)+, Big Chino-Williamson Valley (15060201)+, Upper Verde (15060202)+, Lower Verde (15060203)+, Agua Fria (15070102)+, Hassayampa (15070103)+, Whitewater Draw (15080301)+
16	Upper Bear (16010101)+, Central Bear (16010102)+, Bear Lake (16010201)+, Middle Bear (16010202)+, Little Bear-Logan (16010203)+, Upper Weber (16020101)+, Lower Weber (16020102)+, Utah Lake (16020201)+, Spanish Fork (16020202)+, Provo (16020203)+, Jordan (16020204)+, Hamlin-Snake Valleys (16020301)+*, Pine Valley (16020302)+*, Tule Valley (16020303)+*, Rush-Tooele Valleys (16020304)+*, Southern Great Salt Lake Desert (16020306)+*, Northern Great Salt Lake Desert (16020308)+, Curlew Valley (16020309)+, Upper Sevier (16030001)+, East Fork Sevier (16030002)+, Middle Sevier (16030003)+, Lower Sevier (16030005)+*, Escalante Desert (16030006)+, Beaver Bottoms-Upper Beaver (16030007)+*, Lower Beaver (16030008)+*, Sevier Lake (16030009)+*, North Fork Humboldt (16040102)+, Lake Tahoe (16050101)+, Truckee (16050102)+, East Walker (16050301)+*, West Walker (16050302)+*, Fish Lake-Soda Spring Valleys (16060010)+*
17	Upper Kootenai (17010101)+, Fisher (17010102)+, Yaak (17010103)+, Lower Kootenai (17010104)+, Moyie (17010105)+, Elk (17010106)+, Upper Clark Fork (17010201)+, Flint-Rock (17010202)+,

	Blackfoot (17010203)+, Middle Clark Fork (17010204)+, Bitterroot (17010205)+, North Fork Flathead (17010206)+, Middle Fork Flathead (17010207)+, Flathead Lake (17010208)+, South Fork Flathead (17010209)+, Swan (17010211)+, Lower Flathead (17010212)+, Lower Clark Fork (17010213)+, Pend Oreille Lake (17010214)+, Priest (17010215)+, Pend Oreille (17010216)*, South Fork Coeur D'alene (17010302)+, Coeur D'alene Lake (17010303)+, St. Joe (17010304)+, Upper Spokane (17010305)+, Little Spokane (17010308)*, Franklin D. Roosevelt Lake (17020001)*, Kettle (17020002)*, Colville (17020003)*, Sanpoil (17020004)*, Chief Joseph (17020005)*, Okanogan (17020006)*, Similkameen (17020007)*, Methow (17020008)*, Lake Chelan (17020009)*, Upper Columbia-Entiat (17020010)*, Wenatchee (17020011)*, Upper Yakima (17030001)*, Naches (17030002)*, Lower Yakima, Washington (17030003)*, Snake headwaters (17040101)+, Gros Ventre (17040102)+, Greys-Hobock (17040103)+, Palisades (17040104)+, Salt (17040105)+, Upper Henrys (17040202)+, Lower Henrys (17040203)+, Teton (17040204)+, Willow (17040205)+, Blackfoot (17040207)+, Portneuf (17040208)+, Lake Walcott (17040209)+, Raft (17040210)+, Goose (17040211)+, Upper Snake-Rock (17040212)+, Salmon Falls (17040213)+, Beaver-Camas (17040214)+, Medicine Lodge (17040215)+, Big Lost (17040218)+, Camas (17040220)+, Little Wood (17040221)+, Middle Snake-Succor (17050103)+, Upper Owyhee (17050104)+, South Fork Owyhee (17050105)+, Middle Owyhee (17050107)+, North and Middle Forks Boise (17050111)+, Boise-Mores (17050112)+, South Fork Boise (17050113)+, Lower Malheur (17050117)+, South Fork Payette (17050120)+, Payette (17050122)+, North Fork Payette (17050123)+, Weiser (17050124)+, Brownlee Reservoir (17050201)+, Burnt (17050202)+, Powder (17050203)+, Hells Canyon (17060101)+, Imnaha (17060102)+, Lower Snake-Asotin (17060103)+, Upper Grande Ronde (17060104)+, Wallowa (17060105)+, Lower Grande Ronde (17060106)+, Lower Snake-Tucannon (17060107)*, Palouse (17060108)+, Upper Salmon (17060201)+, Middle Salmon-Panther (17060203)+, Upper Middle Fork Salmon (17060205)+, Middle Salmon-Chamberlain (17060207)+, South Fork Salmon (17060208)+, Lower Salmon (17060209)+, Little Salmon (17060210)+, Lower Selway (17060302)+, Lochsa (17060303)+, Middle Fork Clearwater (17060304)+, South Fork Clearwater (17060305)+, Clearwater (17060306)+, Lower North Fork Clearwater (17060308)+, Middle Columbia-Lake Wallula (17070101)*, Walla Walla (17070102)*, Umatilla (17070103)+, Middle Columbia-Hood (17070105)*, Klickitat (17070106)*, Upper John Day (17070201)+, North Fork John Day (17070202)+, Upper Deschutes (17070301)+, Little Deschutes (17070302)+*, Upper Crooked (17070304)+, Lower Deschutes (17070306)+, Lewis (17080002)*, Lower Columbia-Clatskanie (17080003)*, Upper Cowlitz (17080004)*, Lower Cowlitz (17080005)*, North Santiam (17090005)+, Clackamas (17090011)+, Hoh-Quillayute (17100101)*, Queets-Quinault (17100102)*, Upper Chehalis (17100103)*, Lower Chehalis (17100104)*, Grays Harbor (17100105)*, Willapa Bay (17100106)*, Alsea (17100205)+, Siuslaw (17100206)+, North Umpqua (17100301)+, South Umpqua (17100302)+, Upper Rogue (17100307)+, Middle Rogue (17100308)+, Applegate (17100309)+, Fraser (17110001)*, Nooksack (17110004)*, Upper Skagit (17110005)*, Sauk (17110006)*, Lower Skagit (17110007)*, Stillaguamish (17110008)*, Skykomish (17110009)*, Snoqualmie (17110010)*, Snohomish (17110011)*, Lake Washington (17110012)*, Duwamish (17110013)*, Puyallup (17110014)*, Nisqually (17110015)*, Deschutes (17110016)*, Skokomish (17110017)*, Hood Canal (17110018)*, Puget Sound (17110019)*, Dungeness-Elwha (17110020)*, Crescent-Hoko (17110021)*, Alvord Lake (17120009)+
18	Mad-Redwood (18010102)+*, Upper Eel (18010103)+, Middle Fork Eel (18010104)+, Lower

Ecology & Life History

Collapse

Basic Description: A fairly large hawk; male 55 cm in length with a wingspan of 98-104 cm, female 61 cm in length with a wingspan of 105-115 cm (Squires and Reynolds 1997). Male is brown-gray to slate gray on back, head with black cap and pronounced white supercilary line. Undersides are light gray with fine horizontal vermiculations and fine black vertical streaks. Long, rounded tail, white undertail coverts, dark gray above with 3-5 dark bands and a think, white terminal band (reduced or absent with wear). Female is similar to male but browner on back and more heavily marked on underside, sometimes appearing barred. Feet, cere, toes, legs, and mouth-lining are yellow, eyes are red. Juveniles dark brown to brown-black on back with buff white and cinnamon streaks. Undersides buff white with thick cinnamon to blackish brown streaks on throat. Tail is dark brown with wavy dark-brown bands that are bordered by thin whitish bands, forming a zigzag pattern.

General Description: A fairly large hawk with a long tail, rounded wing tips, and a conspicuous pale eyebrow; adult has dark crown, blue-gray back, white underparts with dense gray barring, and conspicuous fluffy white undertail coverts; immature is brown above, buffy below, with dense blurry streaking, undertail coverts are dark-streaked, and tail has wavy dark bands bordered with white and a thin white tip; total length is 53-66 cm, with females averaging lager than males (NGS 1983).

Reproduction Comments: Usually one clutch produced per year, from late April through early May (Squire and Reynolds 1997); however, some individuals may not breed during cold, wet springs (DeStefano et al. 1994). Egg-laying may begin later at higher elevations and during cold, wet springs (Henny et al. 1985, Younk and Bechard 1994). Clutch is typically two to four eggs, rarely one to five (Squires and Reynolds 1997). Average clutch size of 44 North American clutches is 2.7 eggs (Apfelbaum and Seelbach 1983 cited in Squires and Reynolds 1997). Eggs are laid every two to three days and incubation usually begins after the second egg is laid. Incubation, conducted principally by the female, takes 28-38 days; hatching is asynchronous.

Few data regarding hatching success. In Oregon, hatching success in five nests was 81 percent (Reynolds and Wight 1978 cited in Squires and Reynolds 1997). Nest success (percentage of active nests that fledge greater than one young) in North America ranges from 44-94 percent and most populations produce 2-2.8 fledglings per successful nest (summarized in Squires and Reynolds 1997).

Egg/nestling mortality has been attributed to exposure to cold and rain and siblicide (Boal and Bacorn 1994, Squires and Reynolds 1997). In northern Wisconsin, nest success dropped from 94 percent to 62 percent due to an increase in predation of nest contents and adult females by fishers. Increased predation by fishers was attributed to an increase in the fisher population and nest exposure due to tree defoliation by forest tent caterpillars (MALACOSOMA DISSTRIA; Erdman et al. 1998).

Brooding and feeding of nestlings is performed principally by the female; the male brings food to the nest. The young begin flying at 35-42 days and become independent at about 70 days (Boal 1994, Squires and Reynolds 1997). Maintain one to eight alternate nests within a nest area (Squire and Reynolds 1997). Alternate nests range from 15-2066 meters apart (Reynolds and Wight 1978, cited in Squires and Reynolds 1997; Woodbridge and Detrich 1994). The average distance between nests of nearest neighboring pairs in Arizona was 3 kilometers (range = 1.6-6.4 kilometers; Reynolds et al. 1994). A small percentage (less than 10 percent) of subadults (1-2 years old) are sexually mature; however, most breeding birds are young adults (2-3 years old) or adults (Squires and Reynolds 1997). Nesting by subadults is more frequent in expanding populations and less frequent in stable populations (Reynolds and Wight 1978, cited in Squires and Reynolds 1997).
Ecology Comments: Nesting densities of most western U.S. populations range from 6.6-10.7 pairs per 100 square kilometers (summarized in Squires and Reynolds 1997). The single nesting density estimate for the eastern U.S. is 1.17 pairs per 100 square kilometers (Kimmel and Yahner 1994, cited in Squires and Reynolds 1997). Home ranges during nesting vary from 95-3500 hectares depending on sex and habitat characteristics (Squires and Reynolds 1997). Home ranges of males are typically larger than those of females (Hargis et al. 1994, Keane and Morrison 1994, Kennedy et al. 1994). Exclusive of nesting areas, home ranges of adjacent pairs are not defended and may overlap (Squires and Reynolds 1997). The core area (encompasses nest site) constitutes 32 percent of the home range (Kennedy et al. 1994). Individuals typically enlarge or sometimes shift location of home ranges after breeding (Hargis et al. 1994, Keane and Morrison 1994).

Home ranges of non-breeders are poorly known, but may be larger than those of breeders (Squires and Reynolds 1997). In North America, winter home ranges are unknown. In Sweden, winter home-ranges of males and females were similar and averaged 5700 hectares (Widen 1989).

In California, 76.5 percent of males and 71.4 percent of females returned to the same nesting area in subsequent years. Males were significantly more likely to return to previously-inhabited territories in consecutive years than females (Detrich and Woodbridge 1994). In Arizona, 80 percent of nest areas examined in two consecutive years were re-used the second year by one or both members of the pair banded the first year (Reynolds et al. 1994). Sixty to 72 percent of adults located in consecutive years retained the mate from the previous year (Detrich and Woodbridge 1994, Reynolds et al. 1994).

Dispersal of young is not well documented. Detrich and Woodbridge (1994) recaptured two adult females, banded as nestlings 5-7 years prior, 16 and 24 kilometers from their natal sites. Three females, banded as nestlings and recaptured as breeding adults, moved an average of 21.5 kilometers from their natal sites, and another female, captured as a breeding adult seven years after being banded as a nestling, moved 100 kilometers from its natal site (Squires and Reynolds 1997).

Little is known regarding survivorship in the U.S. In Arizona, annual survivorship of male and females more than 1 year old was estimated to be 68.8 percent and 86.6 percent, respectively (Squires and Reynolds 1997). In Yukon, Canada, an observed population decline was attributed to increased mortality of eggs, nestlings, immatures and adults, as well as to

dispersal following a precipitous decline in number of snowshoe hares (Doyle and Smith 1994). The maximum lifespan of a wild bird is 11 years (Squires and Reynolds 1997). The sex ratio is 1:1 prior to fledging and among adults (Mueller and Berger 1968, Reynolds et al. 1994).
Non-Migrant: Y
Locally Migrant: Y
Long Distance Migrant: N
Mobility and Migration Comments: Generally a permanent resident or conducts only short-distance movements over most of range, but periodically has irruptions of movement out of northern portions of range. Fall migration appears to be influenced by prey availability (Squires and Reynolds 1997). For example, in Yukon Territory, Canada, year-round residents are abundant when snowshoe hares (LEPUS AMERICANUS) are abundant, but scarce in winter when hare population is low (Doyle and Smith 1994). Approximately once per decade, large numbers migrate southward, apparently in response to a decline in prey populations, particularly snowshoe hares and ruffed grouse (BONASA UMBELLUS; Bent 1937, Doyle and Smith 1994, Mueller et al. 1977, Squires and Reynolds 1997). Depending on location and year, fall movements begin in late August through September, peak in late September through mid-November, and typically end in December. Spring movements, which are less pronounced, begin in late February and continue through late May. Movement routes are poorly defined, particularly in the western U.S. In the eastern U.S., migrates along the Great lakes, the Appalachian Mountains and the Atlantic coast (Squires and Reynolds 1997). Some birds make extensive movements; four individuals, banded in Minnesota, were recovered up to 2400 kilometers away in British Columbia (Evans and Rosenfield 1985, cited in Squires and Reynolds 1997; Campbell et al. 1990). Other birds, however, undergo short movements from one elevation to another (Squires and Reynolds 1997).
Palustrine Habitat(s): Riparian
Terrestrial Habitat(s): Forest - Conifer, Forest - Hardwood, Forest - Mixed, Woodland - Conifer, Woodland - Hardwood, Woodland - Mixed
Habitat Comments: BREEDING: Nests in a wide variety of forest types including deciduous, coniferous, and mixed forests. Has a complexity of habitat needs in the breeding season, which vary among forest types and region (Johnsgard 1990). Typically nests in mature or old-growth forests (Hayward and Escano 1989, Reynolds et al. 1982, Speiser and Bosakowski 1987, Squires and Ruggiero 1996, Squires and Reynolds 1997, McClaren 1998, Daw and Stefano 2001), and generally selects larger tracts of forest over smaller tracts (Bosakowski and Speiser 1994, Woodbridge and Detrich 1994). In the eastern U.S., nests in hardwood-hemlock (TSUGA CANADENSIS) forests, where black birch (BETULA LENTA) and American beech (FAGUS GRANDIFOLIA) are preferred nest trees (Speiser and Bosakowski 1987). In the western U.S., characteristically nests in coniferous forests including those dominated by ponderosa pine (PINUS PONDEROSA; Bright-Smith and Mannan 1994, Reynolds et al. 1992), lodgepole pine (PINUS CONTORTA; Squires and Ruggiero 1996), or in mixed forests dominated by various coniferous species including fir (ABIES spp.), Douglas-fir (PSEUDOTSUGA MENZIESII), cedar (THUJA spp.), hemlock, spruce (PICEA spp.), and larch (LARIX spp.; Hayward and Escano 1989, Reynolds et al. 1982). Western birds also nest in deciduous forests dominated by aspen (POPULUS TREMULOIDES), paper birch (BETULA PAPYRIFERA), or willow (SALIX spp.; McGowan 1975, cited in Squires and Reynolds 1997; Swem and Adams 1992, cited in Squires and Reynolds 1997; Younk and Bechard 1994).

While generally associated with remote habitat, goshawks in Europe apparently have adapted to human-occupied landscapes and nest near farms and settlements (Palmer 1988). Palmer noted that this species may be undergoing similar adaptation in northeastern U.S.; for example, it is apparently not uncommon in suburbs of Boston (L. Master, pers. comm.).

Nests are generally constructed in the largest trees of dense, old or mature stands with high canopy closure (60-95 percent) and sparse groundcover, near the bottom of moderate slopes, and near water or dry openings(Bull and Hohmann 1994, Daw and DeStefano 2001, Hargis et al. 1994, Reynolds et al 1982, Siders and Kennedy 1994, Squires and Ruggiero 1996, Younk and Bechard 1994). Occasionally will nest in relatively open stands (10 percent canopy coverage; Reynolds et al. 1982). Nest height above the ground is significantly correlated with nest-tree height (Kennedy 1988, cited in Squires and Reynolds 1997). Nest height ranges from 2.5-43 meters (Gabrielson and Lincoln 1959, Siders and Kennedy 1994). May use same nest in successive years. May use other hawk nest as base. Nests in arctic tundra and taiga have also been documented in interior Alaska (Olendorff et al. 1989).

Forages in both heavily forested and relatively open habitats. In Ponderosa pine forest of Arizona, habitat on sites selected for foraging had higher canopy coverage, greater tree density, and greater density of large trees (greater than 40.5 centimeter DBH), but lower prey abundance than non-foraging sites (Beier and Drennan 1997). In Nevada, foraged in open sagebrush (ARTEMISIA spp.) adjacent to riparian aspen stands (Younk and Bechard 1992, cited in Squires and Reynolds 1997).

NON-BREEDING: habitat requirements during winter are poorly understood, especially in the U.S. (Squires and Reynolds 1997). During winter in Sweden, inhabits a fragmented landscape of forests, clearcuts, wetlands and agricultural lands. Whereas non-forested habitats were used in proportion to their availability, large tracts of mature forest were used preferentially (Widen 1989).
Adult Food Habits: Carnivore
Immature Food Habits: Carnivore
Food Comments: Forages during short flights alternated with brief prey searches from perches. Also hunts by flying rapidly along forest edges, across openings, and through dense vegetation. An opportunistic hunter, preys on a wide variety of vertebrates and, occasionally, insects. Prey is taken on the ground, in vegetation, or in the air. Despite their larger size, females do not capture larger or heavier prey than males (Boal and Mannan 1996). Dominant mammalian prey include five species of tree squirrels, four ground squirrels, and lagomorphs. Frequently killed birds include three galliformes, four corvids, six woodpeckers (piciformes) and the American robin (TURDUS MIGRATORIUS; Squires and Reynolds 1997). During the nesting season, the diet can vary with prey availability. For example, as more fledgling passerines become available, they make up a greater portion of the diet (Linden and Wikman 1983, Reynolds and Meslow 1984). Ratio of mammalian prey to avian prey in the diet during the breeding season (in percent): Arizona, 76:24 and 62:38 (Boal and Mannan 1994, Reynolds et al. 1994); Nevada, 67:32 (Younk and Bechard 1994); New York, 39:61 (Grzybowski and Eaton 1976); and Oregon, 42:59 and 45:55 (Bull and Hohmann 1994, Reynolds and Meslow 1984).

Nonbreeding season food habits are unknown for North American populations. In Sweden, birds dominate the diet during the nesting season (86 percent of prey), whereas in winter, red squirrels (SCIURUS VULGARIS) comprise the bulk of the diet (79 percent; Widen 1987, cited in Squires and Reynolds 1997).
Adult Phenology: Diurnal
Immature Phenology: Diurnal
Length: 66 centimeters
Weight: 1137 grams

Economic Attributes — Not yet assessed
Management Summary — Expand
Population/Occurrence Delineation — Expand
Population/Occurrence Viability — Expand
U.S. Invasive Species Impact Rank (I-Rank) — Not yet assessed
Authors/Contributors — Expand
References — Expand
Use Guidelines & Citation — Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Aegolius funereus - (Linnaeus, 1758)
Boreal Owl

Taxonomic Status: Accepted
Related ITIS Name(s): *Aegolius funereus* (Linnaeus, 1758) (TSN 177938)
French Common Names: nyctale de Tengmalm
Unique Identifier: ELEMENT_GLOBAL.2.105053
Element Code: ABNSB15010
Informal Taxonomy: Animals, Vertebrates - Birds - Other Birds

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Aves	Strigiformes	Strigidae	Aegolius

Genus Size: B - Very small genus (2-5 species)

Check this box to expand all report sections: ☐

Concept Reference

Expand

Conservation Status

Collapse

NatureServe Status

Global Status: G5
Global Status Last Reviewed: 27Nov1996
Global Status Last Changed: 27Nov1996
Rounded Global Status: G5 - Secure
Reasons: Wide range, apparently large numbers and occurrences seem to make this species secure.
Nation: United States
National Status: N4 (05Jan1997)
Nation: Canada
National Status: N5 (13Feb2012)

U.S. & Canada State/Province Status	
United States	Alaska (S4), Colorado (S2), Idaho (S2), Maine (SNA), Michigan (SNRN), Minnesota (SNRB,SNRN), Montana (S4), New Mexico (S2B,S2N), New York (SNRN), Oregon (S3?), Washington (S3), Wisconsin (SNA), Wyoming (S2)
Canada	Alberta (S4), British Columbia (S4), Labrador (S3S4), Manitoba (S3S4B), New Brunswick (S1S2B), Newfoundland Island (S4), Northwest Territories (S4S5), Nova Scotia (S1B), Nunavut (SNR), Ontario (S4), Prince Edward Island (SU), Quebec (S4), Saskatchewan (S3B,S3N), Yukon Territory (S4)

Other Statuses

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Not at Risk (01Apr1995)
IUCN Red List Category: LC - Least concern
Convention on International Trade in Endangered Species Protection Status (CITES): Appendix II

NatureServe Global Conservation Status Factors

Range Extent: 20,000 to >2,500,000 square km (about 8000 to >1,000,000 square miles)
Range Extent Comments: Breeds in North America from treeline in central Alaska east to Newfoundland; south central Oregon in the Cascade and Blue Mountains, and in the Rocky Mountains south through Washington, Idaho, Montana, Wyoming, and Colorado to northern New Mexico; then east through central Saskatchewan, southern Manitoba, northern Minnesota, southern Quebec and Ontario. Breeds in Eurasia from treeline in northern Scandanavia, Russia, and Siberia, south in the mountians to southern Europe, the western Himalayas, and western China (AOU 1983, Hayward and Hayward 1993). Winters mainly in hte breeding range, however it may move south in the eastern U.S. and Europe during eruption years (A.O.U. 1983, Hayward and Hayward 1993).

Number of Occurrences: 81 to >300

Population Size: 10,000 to >1,000,000 individuals
Population Size Comments: Population "large" in Canada (1995 COEWIC unpubl. report).

Overall Threat Impact Comments: Major threat may be indirect effects of forest harvesting practices. These may reduce primary prey populaitons, remove forest structure used for foraging, and eliminates nesting cavities (Hayward and Hayward 1993).

Short-term Trend: Unknown
Short-term Trend Comments: Unknown. Reliable populations number unavailable and nomadism caused by fluctuating prey density complicates this further (Hayward and Hayward 1993). Population "stable" in Canada (COSEWIC 1995 unpubl. report). Although recently discovered breeding far to the south of previously known locations, this is probably due the season and location of breeding (high elevation in February-April) rather than range expansion (Stahlecker and Duncan 1996).

Other NatureServe Conservation Status Information

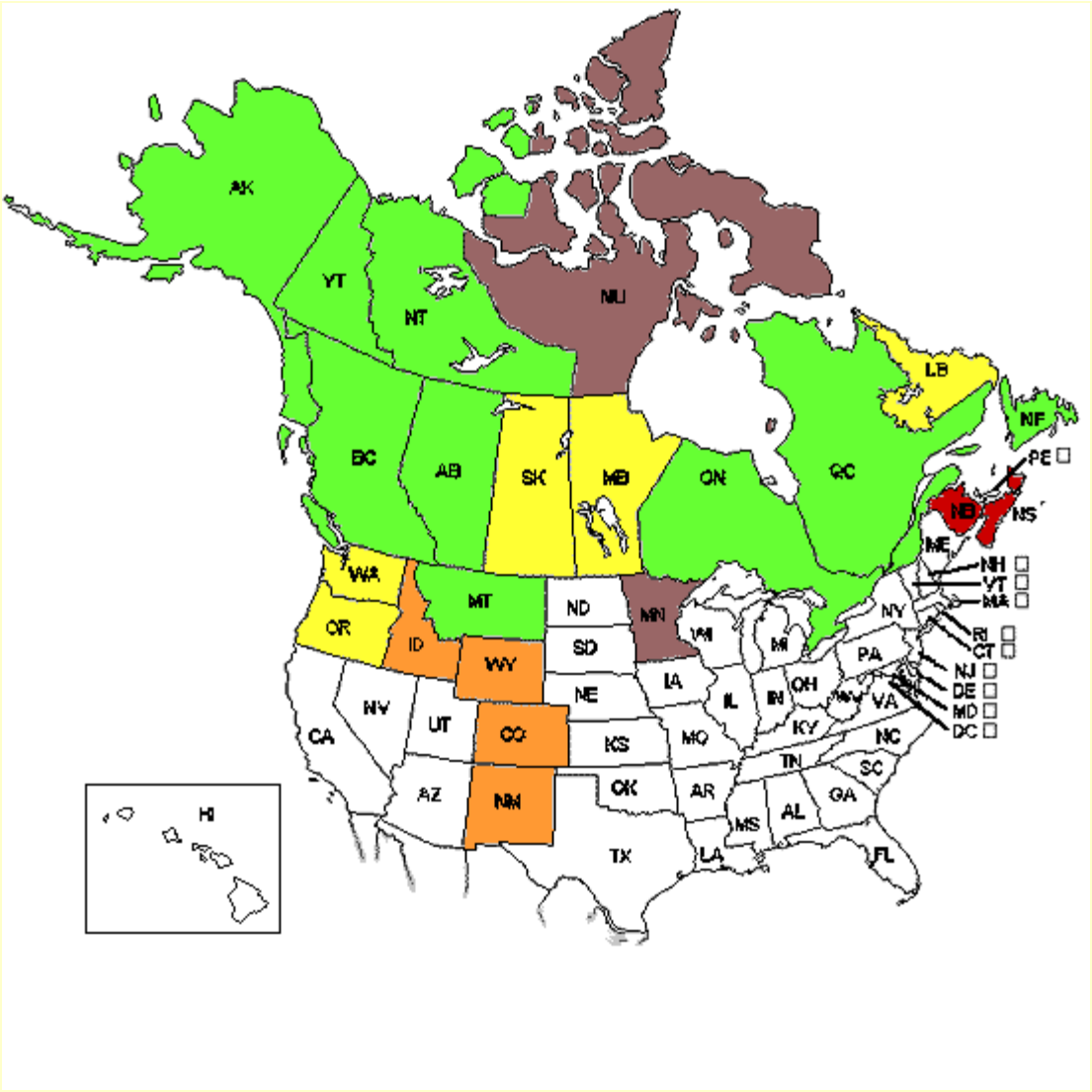
Inventory Needs: May be breeding in northern Wisconsin, Michigan, and Maine, and the mountians of Utah, California, and New England (Hayward and Hayward 1993).

Distribution

Collapse

Global Range: (20,000 to >2,500,000 square km (about 8000 to >1,000,000 square miles)) Breeds in North America from treeline in central Alaska east to Newfoundland; south central Oregon in the Cascade and Blue Mountains, and in the Rocky Mountains south through Washington, Idaho, Montana, Wyoming, and Colorado to northern New Mexico; then east through central Saskatchewan, southern Manitoba, northern Minnesota, southern Quebec and Ontario. Breeds in Eurasia from treeline in northern Scandanavia, Russia, and Siberia, south in the mountians to southern Europe, the western Himalayas, and western China (AOU 1983, Hayward and Hayward 1993). Winters mainly in hte breeding range, however it may move south in the eastern U.S. and Europe during eruption years (A.O.U. 1983, Hayward and Hayward 1993).

U.S. States and Canadian Provinces



State/Province Conservation Status

- SX: Presumed Extirpated
- SH: Possibly Extirpated
- S1: Critically Imperiled
- S2: Imperiled
- S3: Vulnerable
- S4: Apparently Secure
- S5: Secure
- Not Ranked/Under Review (SNR/SU)

Conservation Status Not Applicable (SNA)

- Exotic
- Hybrid without Conservation Value

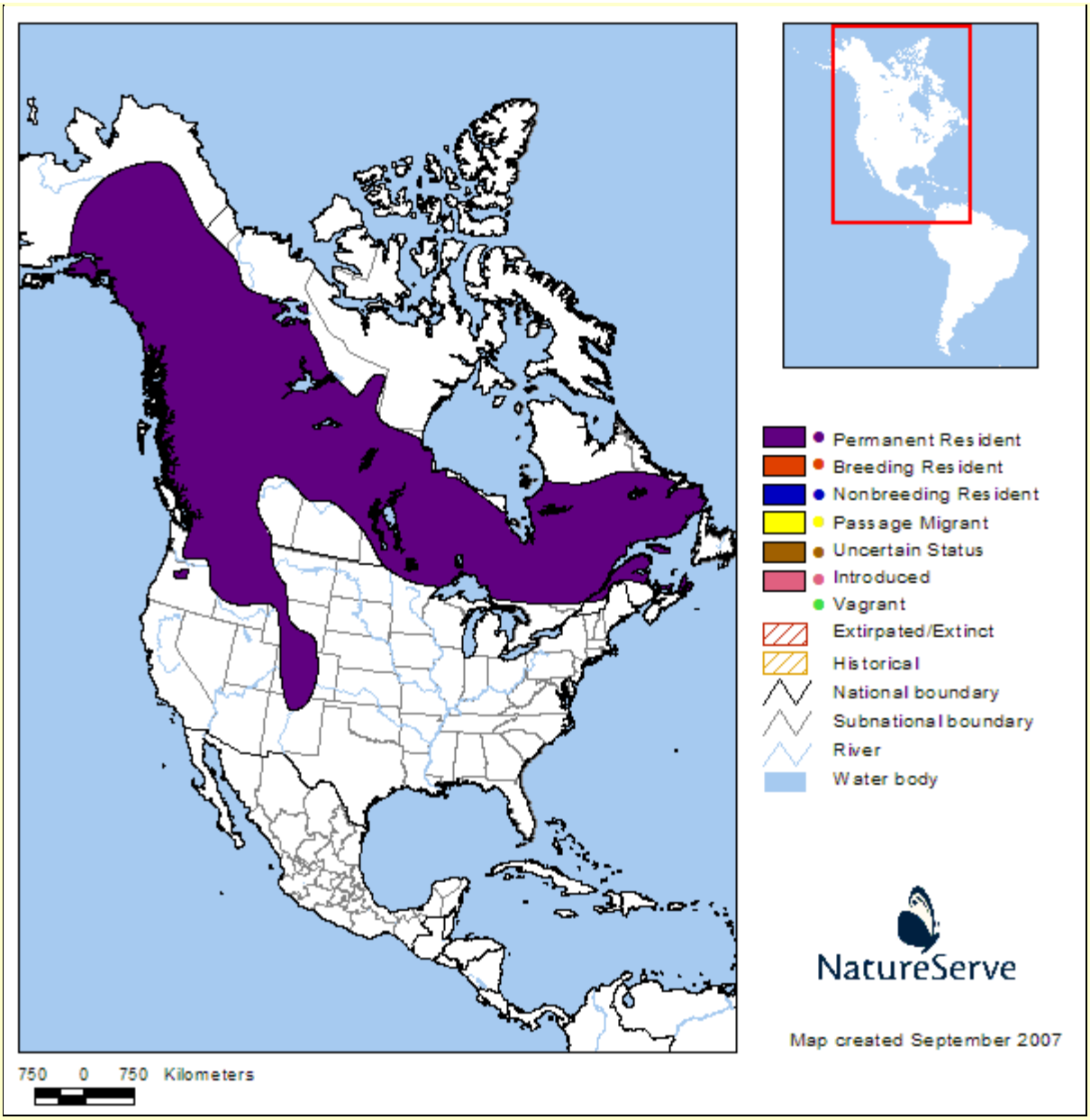
NOTE: The maps for birds represent the breeding status by state and province. In some jurisdictions, the subnational statuses for common species have not been assessed and the status is shown as not-assessed (SNR). In some jurisdictions, the subnational status refers to the status as a non-breeder; these errors will be corrected in future versions of these maps. A species is not shown in a jurisdiction if it is not known to breed in the jurisdiction or if it occurs only accidentally or casually in the jurisdiction. Thus, the species may occur in a jurisdiction as a seasonal non-breeding resident or as a migratory transient but this will not be indicated on these maps. See other maps on this web site that depict the Western Hemisphere ranges of these species at all seasons of the year.

Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	AK, CO, ID, ME, MI, MN, MT, NM, NY, OR, WA, WI, WY
Canada	AB, BC, LB, MB, NB, NF, NS, NT, NU, ON, PE, QC, SK, YT

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: WILDSPACETM 2002

U.S. Distribution by County	
State	**County Name (FIPS Code)**
CO	Chaffee (08015), Clear Creek (08019), Conejos (08021)*, Delta (08029), Dolores (08033), Eagle (08037), Garfield (08045), Grand (08049), Gunnison (08051), Hinsdale (08053), Jackson (08057), Larimer (08069), Mesa (08077), Mineral (08079), Moffat (08081), Montezuma (08083), Ouray (08091)*, Park (08093), Pitkin (08097), Rio Blanco (08103), Rio Grande (08105), Routt (08107), San Juan (08111), San Miguel (08113), Summit (08117)
ID	Adams (16003), Bear Lake (16007), Blaine (16013), Bonner (16017), Boundary (16021), Caribou (16029), Clark (16033), Clearwater (16035), Fremont (16043), Idaho (16049), Lemhi (16059), Shoshone (16079), Teton (16081), Valley (16085)
MN	Cook (27031), Lake (27075), St. Louis (27137)
NM	Mora (35033)*, Rio Arriba (35039), Santa Fe (35049), Taos (35055)*
OR	Baker (41001)*, Deschutes (41017), Grant (41023)*, Jefferson (41031), Umatilla (41059)*, Union (41061)*, Wallowa (41063)*
WA	Pend Oreille (53051)+*

WY	Albany (56001), Fremont (56013), Lincoln (56023), Sublette (56035), Uinta (56041)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
04	Baptism-Brule (04010101)+, St. Louis (04010201)+
09	Rainy Headwaters (09030001)+
10	Upper Wind (10080001)+, North Platte Headwaters (10180001)+, Upper Laramie (10180010)+, Upper South Platte (10190002)+, Clear (10190004)+, Big Thompson (10190006)+*, Cache La Poudre (10190007)+
11	Arkansas Headwaters (11020001)+
13	Rio Grande headwaters (13010001)+, Conejos (13010005)+, Upper Rio Grande (13020101)+, Rio Chama (13020102)+, Rio Grande-Santa Fe (13020201)+, Pecos headwaters (13060001)+
14	Colorado headwaters (14010001)+, Blue (14010002)+, Eagle (14010003)+, Roaring Fork (14010004)+, Colorado headwaters-Plateau (14010005)+, East-Taylor (14020001)+, Upper Gunnison (14020002)+, Tomichi (14020003)+*, Lower Gunnison (14020005)+, Uncompahange (14020006)+*, Upper Dolores (14030002)+, San Miguel (14030003)+, Upper Green (14040101)+, Upper Yampa (14050001)+, Little Snake (14050003)+, Upper White (14050005)+, Piedra (14080102)+, Animas (14080104)+, Mancos (14080107)+
16	Upper Bear (16010101)+, Bear Lake (16010201)+, Middle Bear (16010202)+
17	Lower Kootenai (17010104)+, Moyie (17010105)+, Pend Oreille Lake (17010214)+, Priest (17010215)+, Pend Oreille (17010216)+, St. Joe (17010304)+, Greys-Hobock (17040103)+, Upper Henrys (17040202)+, Teton (17040204)+, Blackfoot (17040207)+, Portneuf (17040208)+, Beaver-Camas (17040214)+, North Fork Payette (17050123)+, Powder (17050203)+*, Upper Grande Ronde (17060104)+*, Wallowa (17060105)+*, Lower Grande Ronde (17060106)+*, Upper Salmon (17060201)+, Middle Salmon-Panther (17060203)+, Upper Middle Fork Salmon (17060205)+, Middle Salmon-Chamberlain (17060207)+, South Fork Salmon (17060208)+, Little Salmon (17060210)+, Lower Selway (17060302)+, Lochsa (17060303)+, South Fork Clearwater (17060305)+, Upper North Fork Clearwater (17060307)+, Lower North Fork Clearwater (17060308)+, Walla Walla (17070102)+*, North Fork John Day (17070202)+*, Upper Deschutes (17070301)+

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: A small owl
Reproduction Comments: Female may occupy the nest cavity 1-3 weeks prior to egg laying (Hayward 1989). In Colorado, nests were initiated from mid-April to early June; mid-April to late May in Idaho (Hayward 1989). Clutch size usually is 4-6. Incubation reported as 25-36 days, by female. Young fledge at about 4-5 weeks, independent at 5-6 weeks, sexually mature by 1 year. Mating system variable. See Johnsgard (1988).
Ecology Comments: In Idaho, annual home range averaged 1528 ha (522-4119 ha); home ranges overlapped extensively; range was larger in winter than in summer; center of winter and summer ranges were separated by average of 2333 m (Hayward et al. 1987). Defends nest site only.
Non-Migrant: Y
Locally Migrant: Y
Long Distance Migrant: N
Mobility and Migration Comments: Periodic large-scale southward irruptions in North America, frequently in synchrony with similar movements of great gray and hawk-owl. Tends to occur at higher elevations in summer; may move to lower elevation for winter. In Colorado, some males remain at high elevations all year; others wander extensively (Johnsgard 1988).
Terrestrial Habitat(s): Forest - Conifer, Forest - Hardwood, Forest - Mixed
Special Habitat Factors: Standing snag/hollow tree
Habitat Comments: Dense coniferous forest, mixed forest, thickets of alder, aspen, or stunted spruce, most commonly in

proximity to open grassy situations (AOU 1983); muskeg bogs. In the Rockies, occurs generally in mature, multilayered spruce-fir forest. Roosts in dense cover by day, in cool microsites in summer; frequently changes roosting site.

Nests in tree hole, natural cavity or old woodpecker hole; sometimes in artificial nest boxes (Harrison 1978). Nest site may be used in consecutive years. Three nest holes in Colorado were 78-100 mm in diameter (see Johnsgard 1988). A nest in Montana was in a dead broken-topped subalpine fir; the cavity opening measured 73 mm X 64 mm (Holt and Ermatinger 1989).

Adult Food Habits: Carnivore
Immature Food Habits: Carnivore
Food Comments: Eats mainly small mammals (often MICROTUS and CLETHRIONOMYS, also SOREX and PEROMYSCUS); also sometimes birds and insects (Bent 1938, Ryder et al. 1987, Hayward 1989).
Adult Phenology: Circadian
Immature Phenology: Circadian
Phenology Comments: May forage day or night; most hunting occurs at night (Hayward 1989).
Length: 25 centimeters
Weight: 167 grams

Economic Attributes — Not yet assessed

Management Summary — Expand

Population/Occurrence Delineation — Expand

Population/Occurrence Viability — Expand

U.S. Invasive Species Impact Rank (I-Rank) — Not yet assessed

Authors/Contributors — Expand

References — Expand

Use Guidelines & Citation — Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Alces americanus - (Clinton, 1822)
Moose
Synonym(s): *Alces alces americanus* (Clinton, 1822)
Taxonomic Status: Accepted
French Common Names: orignal
Unique Identifier: ELEMENT_GLOBAL.2.792092
Element Code: AMALC03010
Informal Taxonomy: Animals, Vertebrates - Mammals - Other Mammals

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Mammalia	Artiodactyla	Cervidae	Alces

Genus Size: B - Very small genus (2-5 species)

Check this box to expand all report sections: ☐

Concept Reference

Expand

Conservation Status

Collapse

NatureServe Status

Global Status: G5
Global Status Last Reviewed: 27Mar2006
Global Status Last Changed: 19Nov1996
Rounded Global Status: G5 - Secure
Nation: United States
National Status: N5 (27Mar2006)
Nation: Canada
National Status: N5 (29Dec2011)

U.S. & Canada State/Province Status	
United States	Alaska (S5), Colorado (SNA), Connecticut (S4), Idaho (S5), Maine (S5), Massachusetts (S4), Michigan (S4), Minnesota (SNR), Montana (S5), New Hampshire (S5), New York (S3S4), North Dakota (SNR), Pennsylvania (SX), Utah (S3S4), Vermont (S5), Washington (S2S3), Wyoming (S5)
Canada	Alberta (S5), British Columbia (S5), Labrador (S5), Manitoba (S5), New Brunswick (S5), Newfoundland Island (SNA), Northwest Territories (S5), Nova Scotia (S1), Nunavut (SNR), Ontario (S5), Quebec (S5), Saskatchewan (S4), Yukon Territory (S5)

Other Statuses

IUCN Red List Category: LC - Least concern

NatureServe Global Conservation Status Factors

Range Extent Comments: Alaska and Canada south through Rockies, northern Great Lakes, and New England; Russia, east of the Yenisei River, east to Anadyr region (eastern Siberia) and south to northern Mongolia and northern China; introduced but now extirpated in New Zealand (Boyeskorov 1999; Grubb, in Wilson and Reeder 2005). This range does not include that of the Eurasia elk (*Alces alces*) here recognized as a distinct species, following Boyeskorov (1999) and Grubb (in Wilson and Reeder 2005).

Arrived in North America from Asia about 11,000-14,000 years ago, shortly before flooding of the Bering land bridge (Hundertmark et al. 2003).

Short-term Trend Comments: Populations increased in Vermont from late 1970s through at least the early 1990 (Vermont Fish & Wildlife Department 1991).

Other NatureServe Conservation Status Information

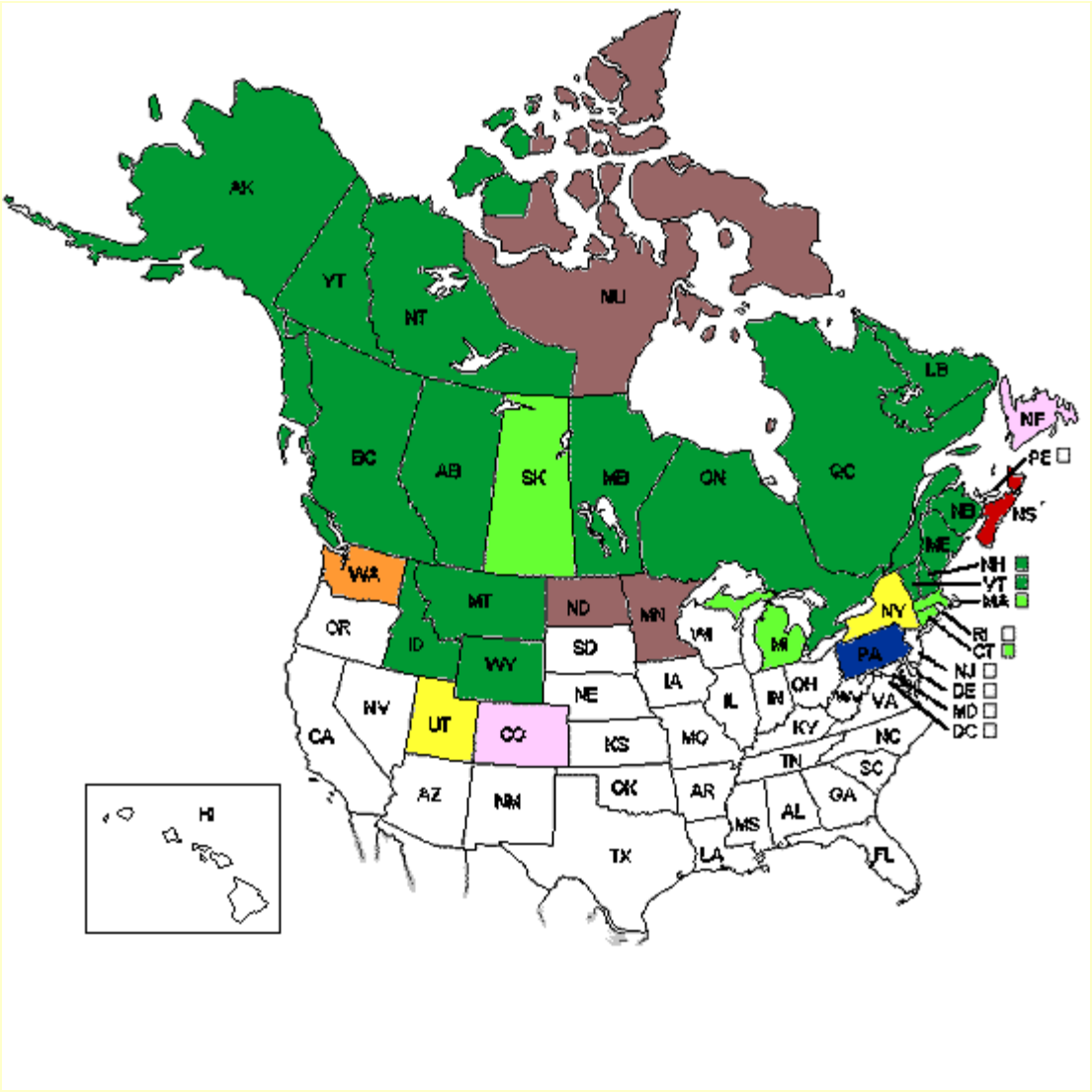
Distribution

Collapse

Global Range: Alaska and Canada south through Rockies, northern Great Lakes, and New England; Russia, east of the Yenisei River, east to Anadyr region (eastern Siberia) and south to northern Mongolia and northern China; introduced but now extirpated in New Zealand (Boyeskorov 1999; Grubb, in Wilson and Reeder 2005). This range does not include that of the Eurasia elk (*Alces alces*) here recognized as a distinct species, following Boyeskorov (1999) and Grubb (in Wilson and Reeder 2005).

Arrived in North America from Asia about 11,000-14,000 years ago, shortly before flooding of the Bering land bridge (Hundertmark et al. 2003).

U.S. States and Canadian Provinces



State/Province Conservation Status

- SX: Presumed Extirpated
- SH: Possibly Extirpated
- S1: Critically Imperiled
- S2: Imperiled
- S3: Vulnerable
- S4: Apparently Secure
- S5: Secure
- Not Ranked/Under Review (SNR/SU)

Conservation Status Not Applicable (SNA)

- Exotic
- Hybrid without Conservation Value

Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	AK, CO, CT, ID, MA, ME, MI, MN, MT, ND, NH, NY, PA, UT, VT, WA, WY
Canada	AB, BC, LB, MB, NB, NF, NS, NT, NU, ON, QC, SK, YT

Range Map

No map available.

U.S. Distribution by County	
State	**County Name (FIPS Code)**
MI	Chippewa (26033)*, Keweenaw (26083)*, Mackinac (26097)*, Menominee (26109)*

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
04	Tahquamenon (04020202)+*, Waiska (04020203)+*, Cedar-Ford (04030109)+*, Brevoort-Millecoquins (04060107)+*, Carp-Pine (04070002)+*

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Reproduction Comments: Breeds September-late October; peak in mid-September. Gestation lasts 240-246 days. One calf (less commonly 2) born late May-early June. Sexually mature in 1.5 years, though females do not reach peak productivity until age 4 years and most males do not breed until 5-6 years old due to intrasexual competition.
Ecology Comments: Depending on habitat, home range may be up to several thousand hectares (Lawson and Rodgers 1997). Population density has been reported as up to 1-3 per sq mile (= 11.6 per 10 sq km) (Peterson 1955), but 18-20 per 10 sq km in unhunted area in eastern Quebec (Crete 1989). May herd in winter.

Winter weather (snow accumulation) may strongly affect populations, even more so than wolf density (Mech et al. 1987); however, Messier (1991) found that competition for food, but not wolf predation and snow, had a regulatory impact on moose. Van Ballenberghie and Ballard (1994) found that in naturally regulated ecosystems predation by bears and wolves often is limiting and may be regulating under certain conditions. See also Messier (1994, Ecology 75:478-488) for population models of moose-wolf interactions.

Under favorable conditions, capable of large annual increases (20-25%) in population size; large populations may degrade habitat, resulting in population crash. See Albright and Keith (1987) for study of population dynamics of introduced population in Newfoundland (poor winter condition but high calf-survival [few predators]).

See Nudds (1990) for discussion of relation between white-tailed deer, moose, and meningeal (brain) worms. Brainworm may limit moose populations in areas where white-tailed deer are common. Deer are not negatively impacted by the brainworm, the larval stage of which is passed in deer feces. Snails, often inadvertently ingested by moose feeding on vegetation, are the intermnediate host for the worm. Deer, through worm-mediated impacts, commonly are believed to exclude moose and caribou from areas where deer occur; however, an analysis by Schmitz and Nudds (1994) concluded that moose may be able to coexist with deer, albeit at lower densities, even in the absence of habitat refuges from the disease. Whitlaw and Lankester (1994) found that the evidence that brainworm has caused moose declines is weak.

Moose may alter the structure and dynamics of boreal forest ecosystems. At Isle Royale, Michigan, moose browsing prevented saplings of preferred species from growing into the tree canopy, resulting in a forest with fewer canopy trees and a well-developed understory of shrubs and herbs; also, browsing may have caused an increase in spruce and a decrease in balsam fir (McInnes et al. 1992).
Non-Migrant: Y
Locally Migrant: Y
Long Distance Migrant: N
Mobility and Migration Comments: May make short elevational or horizontal migrations between summer and winter ranges.
Riverine Habitat(s): CREEK, MEDIUM RIVER
Lacustrine Habitat(s): Shallow water
Palustrine Habitat(s): Bog/fen, FORESTED WETLAND, HERBACEOUS WETLAND, Riparian, SCRUB-SHRUB WETLAND
Terrestrial Habitat(s): Alpine, Forest - Conifer, Forest - Hardwood, Forest - Mixed, Shrubland/chaparral, Tundra, Woodland - Conifer, Woodland - Hardwood, Woodland - Mixed
Habitat Comments: Prefers mosaic of second-growth forest, openings, swamps, lakes, wetlands. Requires water bodies for foraging and hardwood-conifer forests for winter cover. Avoids hot summer conditions by utilizing dense shade or bodies of water. Mineral licks may be important sodium source, used in early summer in Alaska. In the northern Yellowstone ecosystem, depends on old growth forest in winter (see Maxwell, Audubon, May-June 1994, p. 112). Young are born in protective areas of dense thickets.
Adult Food Habits: Herbivore
Immature Food Habits: Herbivore
Food Comments: Summer: prefers to browse on new growth of trees and shrubs (leaves, twigs, and bark), and vegetation associated with water (attracted to high-sodium aquatic plants). Winter: typically restricted to conifer and hardwood twigs.
Adult Phenology: Circadian
Immature Phenology: Circadian
Phenology Comments: Active day or night, though mainly crepuscular.

Length: 279 centimeters
Weight: 630000 grams

Economic Attributes Expand

Management Summary Expand

Population/Occurrence Delineation Expand

Population/Occurrence Viability Expand

U.S. Invasive Species Impact Rank (I-Rank) Not yet assessed

Authors/Contributors Expand

References Expand

Use Guidelines & Citation Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Canis lupus - Linnaeus, 1758
Gray Wolf
Other English Common Names: Grey Wolf, Wolf
Taxonomic Status: Accepted
Related ITIS Name(s): *Canis lupus* Linnaeus, 1758 (TSN 180596)
French Common Names: loup gris
Spanish Common Names: Lobo Gris
Unique Identifier: ELEMENT_GLOBAL.2.105212
Element Code: AMAJA01030
Informal Taxonomy: Animals, Vertebrates - Mammals - Carnivores


Public Domain

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Mammalia	Carnivora	Canidae	Canis

Genus Size: C - Small genus (6-20 species)

Check this box to expand all report sections: ☐

Concept Reference
Expand

Conservation Status
Collapse

NatureServe Status

Global Status: G4G5
Global Status Last Reviewed: 17Feb2006
Global Status Last Changed: 15Nov1996
Rounded Global Status: G4 - Apparently Secure
Reasons: Holarctic distribution; survives in wilderness that is not subject to human population pressures; extirpated from most of contiguous U.S. due to human-caused direct mortality; reintroduced populations in Yellowstone and central Idaho have been increasing rapidly; many (tens of thousands) remain in Canada/Alaska, about 2000 south of Canada, 100,000+ in Palearctic. NatureServe rank calculator version 3.1 yielded a rank of G5? and this species is nationally ranked N5 in Canada. However, until a more comprehensive review can be done by NatureServe, our rank will remain G4G5.
Nation: United States
National Status: N4 (05Sep1996)
Nation: Canada
National Status: N5 (29Dec2011)

U.S. & Canada State/Province Status	
	Alabama (SX), Alaska (S4), Arizona (S1), Arkansas (SX), California (S1), Colorado (SX), Connecticut (SX),

United States	Delaware (SX), District of Columbia (SX), Florida (SX), Georgia (SX), Idaho (S3), Illinois (S1), Indiana (SX), Iowa (SX), Kansas (SX), Kentucky (SX), Maine (SH), Maryland (SX), Massachusetts (SX), Michigan (S3), Minnesota (S3), Missouri (SX), Montana (S4), Navajo Nation (SX), Nebraska (SX), Nevada (SH), New Hampshire (SX), New Jersey (SX), New Mexico (S1), New York (SX), North Carolina (SX), North Dakota (SX), Ohio (SX), Oklahoma (SX), Oregon (S1S2), Pennsylvania (SX), Rhode Island (SX), Tennessee (SX), Texas (SX), Utah (SX), Vermont (SX), Virginia (SX), Washington (S1), West Virginia (SX), Wisconsin (S4), Wyoming (S1)
Canada	Alberta (S4), British Columbia (S4), Labrador (S4), Manitoba (S4), New Brunswick (SX), Newfoundland Island (SX), Northwest Territories (S5), Nova Scotia (SX), Nunavut (SNR), Ontario (S4), Prince Edward Island (SX), Quebec (S4S5), Saskatchewan (S4), Yukon Territory (S4)

Other Statuses

Implied Status under the U.S. Endangered Species Act (USESA): PS:LE, XN, PDL
Comments on USESA: Latest update (June 13, 2013): FWS proposes to remove the gray wolf (*Canis lupus*) from the List of Endangered and Threatened Wildlife but to maintain endangered status for the Mexican wolf by listing it as a subspecies (*Canis lupus baileyi*).

June 2013 Summary of Proposed Rule Analyses and Results:

Canis lupus: current listed entity-all or portions of 42 States and Mexico. Delist.
Canis lupus: species-rangewide. Listing not warranted.
Canis lupus nubilus: subspecies-rangewide. Listing not warranted.
Canis lupus occidentalis: subspecies-rangewide. Listing not warranted.
Canis lupus baileyi: subspecies-rangewide. List as endangered.
C. lupus in Pacific Northwest: Western Washington, Western Oregon, and Northern California. Not a listable entity

The FWS is currently monitoring the following populations of the Gray wolf (per the USFWS species profile as of Sept. 2012):

Listing status: Endangered
Population location: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, KS, KY, LA, MA, MD, ME, MO, MS, NC, NE, NH, NJ, NV, NY, OK, PA, RI, SC, TN, VA, VT and WV; those portions of AZ, NM, and TX not included in an experimental population as set forth below; and portions of IA, IN, IL, ND, OH, OR, SD, UT, and WA as follows: (1) Southern IA, (that portion south of the centerline of Highway 80); (2) Most of IN (that portion south of the centerline of Highway 80); (3) Most of IL (that portion south of the centerline of Highway 80); (4) Western ND (that portion south and west of the Missouri River upstream to Lake Sakakawea and west of the centerline of Highway 83 from Lake Sakakawea to the Canadian border); (5) Most of OH (that portion south of the centerline of Highway 80 and east of the Maumee River at Toledo); (6) Western OR (that portion of OR west of the centerline of Highway 395 and Highway 78 north of Burns Junction and that portion of OR west of the centerline of Highway 95 south of Burns Junction); (7) Western SD (that portion south and west of the Missouri River); (8) Most of Utah (that portion of UT south and west of the centerline of Highway 84 and that portion of UT south of Highway 80 from Echo to the UT / WY Stateline); and (9) Western WA (that portion of WA west of the centerline of Highway 97 and Highway 17 north of Mesa and that portion of WA west of the centerline of Highway 395 south of Mesa). Mexico.

Listing status: Endangered
Population location: Colorado , Michigan , Nebraska , Nevada , New Mexico , North Dakota , Oregon , South Dakota , Utah , Washington , Wisconsin

Listing status: Experimental Population, Non-Essential.
Population location: U.S.A. (portions of AZ, NM and TX)

Listing status: Delisted due to Recovery.
Population location: U.S.A. (MN)

Listing status: Delisted due to Recovery.
Population location: Western Great Lakes Distinct Population Segment; Minnesota, Wisconsin, and Michigan; the eastern half of North Dakota and South Dakota; the northern half of Iowa; the northern portions of Illinois and Indiana; and the

northwestern portion of Ohio.

Listing status: Delisted due to Recovery.
Population location: Northern Rocky Mountain Gray Wolf Distinct Population Segment; Montana, Idaho, eastern Washington, eastern Oregon, and north central Utah.

Listing status: Delisted due to Recovery.
Population location: U.S.A. (WY). This action also makes obsolete and removes the Yellowstone Experimental Population Area established in 1994 to facilitate reintroductions.

In a 12-month finding on two petitions to list the Mexican gray wolf (Canis lupus baileyi) (Mexican wolf) as an endangered subspecies or Distinct Population Segment (DPS), USFWS determined that since the Mexican wolf is currently listed as endangered within the broader 1978 gray wolf listing, action is not warranted at this time (Federal Register, 9 October 2012).
Implied Status under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC): SC,NAR,DD
Comments on COSEWIC: Subspecies *lycaon* is designated Special Concern. Subspecies *occidentalis* and *nubilus* are designated Not at Risk and subspecies *arctos* is designated Data Deficient.

IUCN Red List Category: LC - Least concern
Convention on International Trade in Endangered Species Protection Status (CITES): Appendix II

NatureServe Global Conservation Status Factors

Range Extent: >2,500,000 square km (greater than 1,000,000 square miles)
Range Extent Comments: Formerly throughout North America south through much of Mexico; also Europe and Asia. Replaced by the red wolf in the southeastern United States. Today found south of Canada only in northern Mexico (no recent confirmed reports; extirpated or maybe a few in eastern Sonora, Chihuahua, and/or Zacatecas?), a few areas in the Rocky Mountains (northwestern Montana, reintroduction sites in Wyoming and Idaho), northwestern Great Lakes region (northeastern third of Minnesota, northern Wisconsin, Michigan Upper Peninsula), and Cascade Mountains of northern Washington. Formerly much more numerous in the Rocky Mountain states than in the southwestern U.S. (Johnson 1991). Extirpated in much of southern Canada (see Theberge [1992] and Can. Field-Nat. 106:138 for range/status map); remains in 85% of former total Canadian range (Theberge 1991).

In 1995, wolf reintroductions were initiated in the Yellowstone ecosystem and in central Idaho (nonessential experimental populations) (USFWS 1994; Federal Register, 16 August 1994; Bangs and Fritts 1993; End. Sp. Bull. 20(4):4-5). See Bangs et al. (1998) for information on the status of gray wolf restoration in Montana, Idaho, and Wyoming. In 1998, USFWS (Federal Register, 12 January 1998) announced its intention to reintroduce the Mexican gray wolf (subspecies *baileyi*) into Arizona and New Mexico (Apache and Gila national forests, also possibly White Sands Missile Range).

Wolf observations in the Dakotas have increased in recent years, likely related to range expansion and population increases in adjacent areas, especially Minnesota; most occurrences have been of young individuals, suggesting dispersal (Licht and Fritts 1994).

Grewal et al. (2004) used genetic data to determine that the wolf population in Algonquin Provincial Park in Ontario, Canada, is a southern part of a larger metapopulation of *Canis lycaon* (or *Canis lupus lycaon*).

Number of Occurrences: 81 to >300
Number of Occurrences Comments: Because wolves are wide-ranging it is difficult to estimate the number of distinct occurrences. The 30-km separation between EOs given in EOSPECS is a compromise figure. It could have been smaller in the northern USA where pack home ranges in Minnesota were 130 km2, or larger in Alaska where home ranges up to 13,000 km2 are reported (Mech and Frenzel 1971, Burkholder 1959).

Population Size: 10,000 to >1,000,000 individuals
Population Size Comments: Canada: about 50,000-58,500 in 1990; subject to hunting and trapping in all but a few percent of the range (Cohn 1990, Theberge 1991).

Alaska: about 6000 (Theberge 1991).

In 1998, there were at least 65 wolves in northwestern Montana, at least 122 in central Idaho, and 116 in the Greater Yellowstone Area (Bangs et al. 1998). In 2004, the northern Rocky Mountains population included more than 800 wolves (USFWS 2006).

Isle Royale population was about 14-16 in 1995. Michigan Upper Peninsula population was 112 in 1996/1997 (End. Sp. Bull. 22(3):21). Wisconsin: 150 in 1997-1997 (End. Sp. Bull. 22(3):21). Minnesota: nearly 2000 in mid-1990s (Mladenoff et al. 1997).

Southwestern U.S. and Mexico: none in the U.S. and very few if any in Mexico.

See Jhala and Giles (1991) for information on status in northwestern India (several hundred remain). Population estimates for the 1980s: former Soviet Union, 88,000; Inner Mongolia, less than 10,000; Yugoslavia, 2000-5000; Poland, about 1000; Spain, about 1000; 2000 or less in each of Iran, Afganistan, India, and Romania (see Theberge 1991). Population in the USSR in the mid-1940s was about 200,000-300,000; reduced to lowest numbers in history by the 1960s; increased to 1940s level by the 1980s; about 40,000 in Russia in 1995 (Yuli Gabur 1996, Natural Areas News 1(2):8-9).

Overall Threat Impact Comments: Exterminated from large areas through trapping, shooting, poisoning, and reduction in prey populations (ungulate herds). Threatened by direct human-caused mortality and possibly habitat loss. Landscape change resulting from development may interfere with restoration in some areas (Carroll et al. 2003). Heavily persecuted in former Soviet Union and in China.

The threats to the northern Rocky Mountain wolf population have been reduced or eliminated as evidenced by the population exceeding the numerical, distributional, and temporal recovery goals each year since 2002 (USFWS 2006).

Short-term Trend Comments: The Northern Rocky Mountain population increased steadily from 1979 to 2004 (USFWS 2006). Wolf recovery in the Greater Yellowstone Ecosystem and in central Idaho has progressed faster than predicted (Bangs et al. 1998).

Currently expanding in the northcentral United States. Mech et al. (1995) documented dispersal and recolonization from northern Minnesota to Wisconsin and Michigan.

Wolf recovery has been noted in some areas of Europe (see Cohn 1990). Increasing in Russia in the mid-1990s (Y. Gabur). Trends elsewhere are unknown.

Other NatureServe Conservation Status Information

Inventory Needs: Determine distribution in Europe and Asia.

Protection Needs: Need to protect several large tracts of lands as rangeland for wolf packs.

Distribution

Collapse

Global Range: (>2,500,000 square km (greater than 1,000,000 square miles)) Formerly throughout North America south through much of Mexico; also Europe and Asia. Replaced by the red wolf in the southeastern United States. Today found south of Canada only in northern Mexico (no recent confirmed reports; extirpated or maybe a few in eastern Sonora, Chihuahua, and/or Zacatecas?), a few areas in the Rocky Mountains (northwestern Montana, reintroduction sites in Wyoming and Idaho), northwestern Great Lakes region (northeastern third of Minnesota, northern Wisconsin, Michigan Upper Peninsula), and Cascade Mountains of northern Washington. Formerly much more numerous in the Rocky Mountain states than in the southwestern U.S. (Johnson 1991). Extirpated in much of southern Canada (see Theberge [1992] and Can. Field-Nat. 106:138 for range/status map); remains in 85% of former total Canadian range (Theberge 1991).

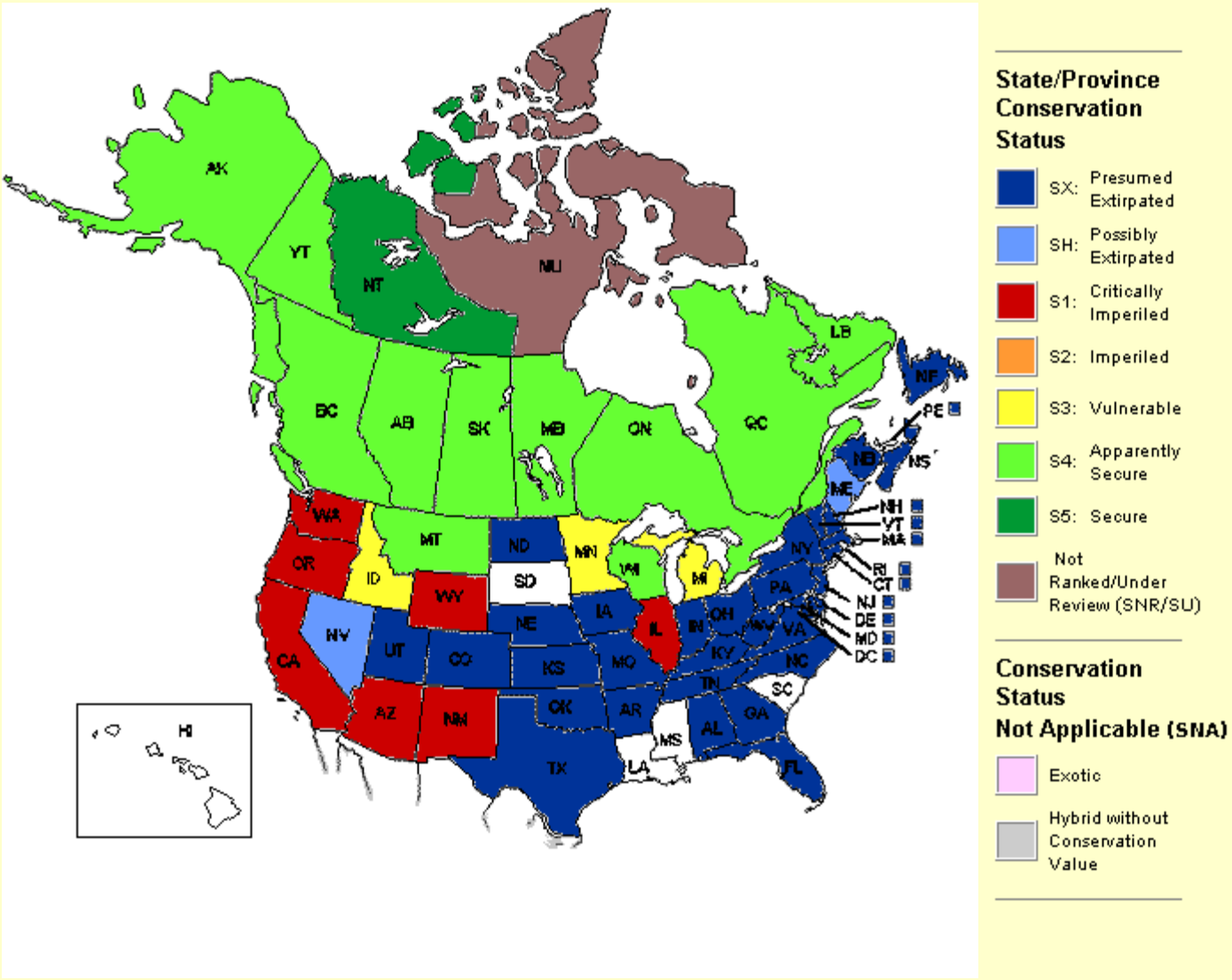
In 1995, wolf reintroductions were initiated in the Yellowstone ecosystem and in central Idaho (nonessential experimental

populations) (USFWS 1994; Federal Register, 16 August 1994; Bangs and Fritts 1993; End. Sp. Bull. 20(4):4-5). See Bangs et al. (1998) for information on the status of gray wolf restoration in Montana, Idaho, and Wyoming. In 1998, USFWS (Federal Register, 12 January 1998) announced its intention to reintroduce the Mexican gray wolf (subspecies *baileyi*) into Arizona and New Mexico (Apache and Gila national forests, also possibly White Sands Missile Range).

Wolf observations in the Dakotas have increased in recent years, likely related to range expansion and population increases in adjacent areas, especially Minnesota; most occurrences have been of young individuals, suggesting dispersal (Licht and Fritts 1994).

Grewal et al. (2004) used genetic data to determine that the wolf population in Algonquin Provincial Park in Ontario, Canada, is a southern part of a larger metapopulation of *Canis lycaon* (or *Canis lupus lycaon*).

U.S. States and Canadian Provinces

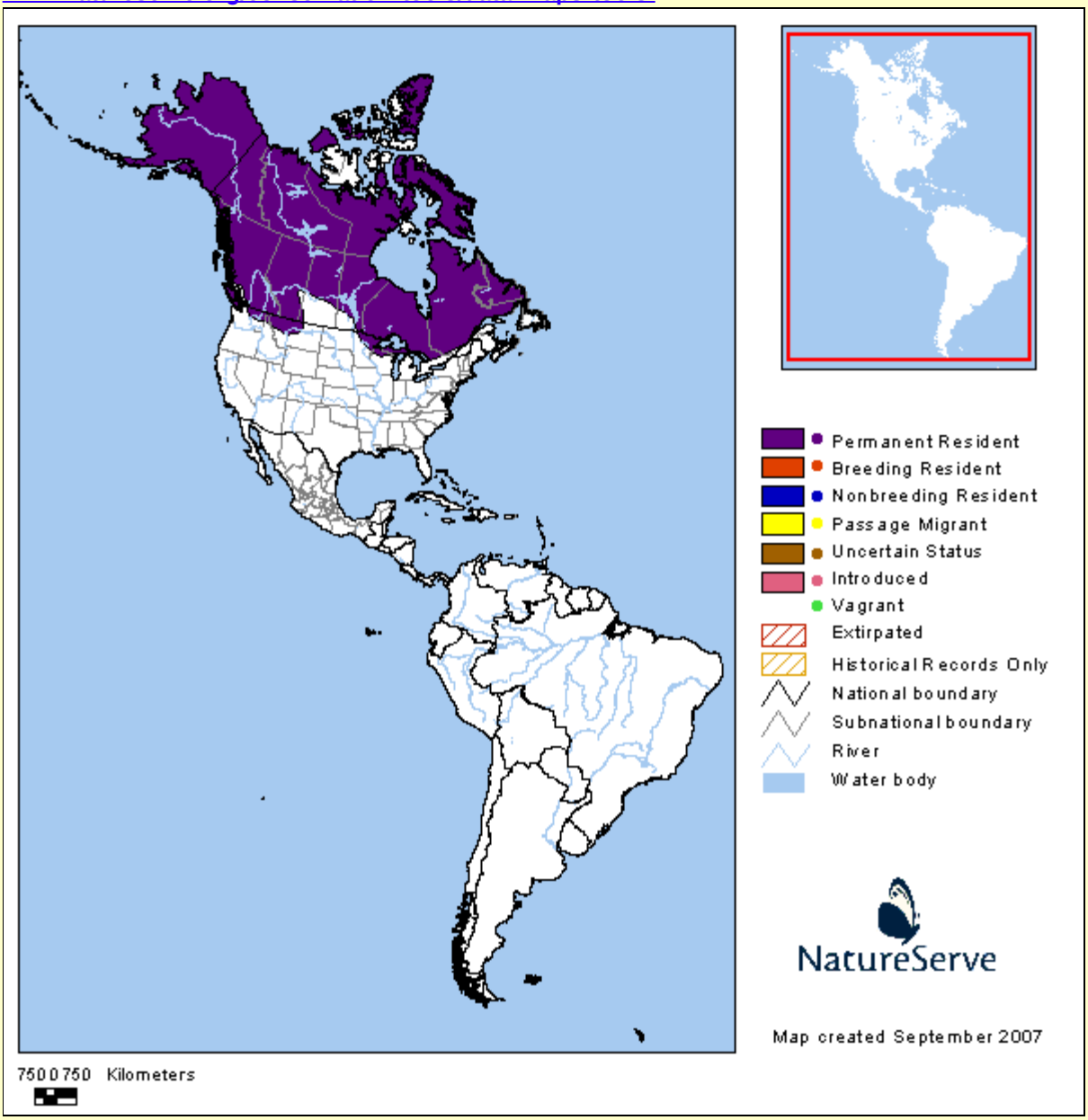


Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	AK, AL, AR, AZ, CA, CO, CT, DC, DE, FL, GA, IA, ID, IL, IN, KS, KY, MA, MD, ME, MI, MN, MO, MT, NC, ND, NE, NH, NJ, NM, NN, NV, NY, OH, OK, OR, PA, RI, TN, TX, UT, VA, VT, WA, WI, WV, WY
Canada	AB, BC, LB, MB, NB, NF, NS, NT, NU, ON, PE, QC, SK, YT

Range Map
Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small

islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: Sechrest, 2002

U.S. Distribution by County	
State	**County Name (FIPS Code)**
AK	Haines (02100), Juneau (02110), Ketchikan Gateway (02130), Prince of Wales-Outer Ketchikan (CA) (02201), Skagway-Hoonah-Angoon (CA) (02232), Wrangell-Petersburg (CA) (02280), Yakutat (02282)
CA	Butte (06007), Lassen (06035), Modoc (06049), Plumas (06063), San Bernardino (06071)*, Shasta (06089), Siskiyou (06093), Tehama (06103)
ID	Adams (16003), Benewah (16009), Blaine (16013), Boise (16015), Bonner (16017), Boundary (16021), Camas (16025), Clark (16033), Clearwater (16035), Custer (16037), Elmore (16039), Fremont (16043), Gem (16045), Idaho (16049), Kootenai (16055), Latah (16057), Lemhi (16059), Madison (16065), Shoshone (16079), Teton (16081), Valley (16085)
IL	Carroll (17015), Jo Daviess (17085), Lake (17097), Marshall (17123), Pike (17149), Whiteside (17195)
MI	Chippewa (26033)*, Iron (26071), Keweenaw (26083)
MT	Beaverhead (30001), Broadwater (30007), Carbon (30009), Cascade (30013), Deer Lodge (30023),

	Flathead (30029), Gallatin (30031), Glacier (30035), Granite (30039), Jefferson (30043), Judith Basin (30045), Lake (30047), Lewis and Clark (30049), Lincoln (30053), Madison (30057), Meagher (30059), Mineral (30061), Missoula (30063), Park (30067), Pondera (30073), Powell (30077), Ravalli (30081), Sanders (30089), Silver Bow (30093), Stillwater (30095), Sweet Grass (30097), Teton (30099), Wheatland (30107)
NM	Catron (35003)*, Hidalgo (35023)*, Socorro (35053)*
OR	Baker (41001), Clackamas (41005)*, Deschutes (41017)*, Douglas (41019)*, Grant (41023)*, Jackson (41029)*, Josephine (41033)*, Klamath (41035)*, Lake (41037)*, Lane (41039)*, Malheur (41045)*, Umatilla (41059), Union (41061), Wallowa (41063)
UT	Box Elder (49003)*, Duchesne (49013)*, San Juan (49037)*, Summit (49043)*, Washington (49053)*, Weber (49057)*
WA	Asotin (53003)+*, Chelan (53007)+*, Clallam (53009)+*, Clark (53011)+*, Columbia (53013)+*, Ferry (53019)+*, King (53033)+*, Kittitas (53037)+*, Klickitat (53039)+*, Lewis (53041)+*, Lincoln (53043)+*, Mason (53045)+*, Okanogan (53047)+*, Pend Oreille (53051)+*, Pierce (53053)+*, Skagit (53057)+*, Skamania (53059)+*, Snohomish (53061)+*, Spokane (53063)+*, Stevens (53065)+*, Whatcom (53073)+*, Yakima (53077)+*
WI	Ashland (55003), Bayfield (55007), Burnett (55013), Douglas (55031), Dunn (55033), Florence (55037), Iron (55051), Jackson (55053), Juneau (55057), Langlade (55067), Lincoln (55069), Marathon (55073), Marinette (55075), Marquette (55077), Menominee (55078), Monroe (55081), Oconto (55083), Oneida (55085), Polk (55095), Price (55099), Rusk (55107), Sawyer (55113), Shawano (55115), Vilas (55125), Washburn (55129)
WY	Albany (56001)*, Big Horn (56003), Campbell (56005)*, Carbon (56007)*, Converse (56009)*, Crook (56011)*, Fremont (56013), Hot Springs (56017), Johnson (56019), Laramie (56021)*, Lincoln (56023), Natrona (56025)*, Niobrara (56027)*, Park (56029), Platte (56031)*, Sheridan (56033)*, Sublette (56035), Sweetwater (56037)*, Teton (56039), Washakie (56043), Weston (56045)*

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
04	Beartrap-Nemadji (04010301)+, Bad-Montreal (04010302)+, Oconto (04030104)+, Peshtigo (04030105)+, Brule (04030106)+, Menominee (04030108)+, Upper Fox (04030201)+, Wolf (04030202)+
07	Upper St. Croix (07030001)+, Namekagon (07030002)+, Lower St. Croix (07030005)+, La Crosse-Pine (07040006)+, Black (07040007)+, Upper Chippewa (07050001)+, Flambeau (07050002)+, South Fork Flambeau (07050003)+, Jump (07050004)+, Red Cedar (07050007)+, Apple-Plum (07060005)+, Upper Wisconsin (07070001)+, Lake Dubay (07070002)+, Castle Rock (07070003)+, Lower Rock (07090005)+, The Sny (07110004)+, Upper Fox (07120006)+, Lower Illinois-Senachwine Lake (07130001)+
09	St. Marys (09040001)+, Belly (09040002)+
10	Red Rock (10020001)+, Beaverhead (10020002)+, Ruby (10020003)+, Big Hole (10020004)+, Jefferson (10020005)+, Boulder (10020006)+, Madison (10020007)+, Gallatin (10020008)+, Upper Missouri (10030101)+, Upper Missouri-Dearborn (10030102)+, Smith (10030103)+, Sun (10030104)+, Belt (10030105)+, Two Medicine (10030201)+, Cut Bank (10030202)+, Marias (10030203)+, Teton (10030205)+, Arrow (10040102)+, Judith (10040103)+, Upper Musselshell (10040201)+, Milk Headwaters (10050001)+, Yellowstone Headwaters (10070001)+, Upper Yellowstone (10070002)+, Shields (10070003)+, Upper Yellowstone-Lake Basin (10070004)+, Stillwater (10070005)+, Clarks Fork Yellowstone (10070006)+, Upper Wind (10080001)+, Little Wind (10080002)+*, Lower Wind (10080005)+*, Badwater (10080006)+*, Upper Bighorn (10080007)+, Nowood (10080008)+, Greybull (10080009)+, Big Horn Lake (10080010)+*, North Fork Shoshone (10080012)+, South Fork Shoshone (10080013)+, Shoshone (10080014)+, Little Bighorn (10080016)+*, Upper Tongue (10090101)+*, Middle Fork Powder (10090201)+, Upper Powder (10090202)+*, South Fork Powder (10090203)+*, Salt (10090204)+*, Crazy Woman (10090205)+, Clear (10090206)+, Little Powder (10090208)+*, Upper Little Missouri (10110201)+*, Antelope (10120101)+*, Dry Fork Cheyenne (10120102)+*, Upper

	Cheyenne (10120103)+*, Lance (10120104)+*, Lightning (10120105)+*, Angostura Reservoir (10120106)+*, Beaver (10120107)+*, Hat (10120108)+*, Upper Belle Fourche (10120201)+*, Lower Belle Fourche (10120202)+*, Redwater (10120203)+*, Niobrara Headwaters (10150002)+*, Pathfinder-Seminoe Reservoirs (10180003)+*, Sweetwater (10180006)+*, Middle North Platte-Casper (10180007)+*, Glendo Reservoir (10180008)+*, Upper Laramie (10180010)+*, Crow (10190009)+*, Upper Lodgepole (10190015)+*
13	Rio Grande-Albuquerque (13020203)+*, Elephant Butte Reservoir (13020211)+*, Mimbres (13030200)+*, Playas Lake (13030201)+*
14	Upper Dolores (14030002)+*, Upper Colorado-Kane Springs (14030005)+*, Upper Green (14040101)+, New Fork (14040102)+, Bitter (14040105)+*, Blacks Fork (14040107)+*, Muddy (14040108)+*, Great Divide closed basin (14040200)+*, Little Snake (14050003)+*, Muddy (14050004)+*, Duchesne (14060003)+*, Strawberry (14060004)+*
15	Fort Pierce Wash (15010009)+*, Upper Gila (15040001)+*, Animas Valley (15040003)+*, San Simon (15040006)+*, Cloverdale (15080303)+*
16	Upper Bear (16010101)+*, Central Bear (16010102)+*, Lower Weber (16020102)+*, Northern Great Salt Lake Desert (16020308)+*
17	Upper Kootenai (17010101)+, Fisher (17010102)+, Yaak (17010103)+, Lower Kootenai (17010104)+, Moyie (17010105)+, Elk (17010106)+, Upper Clark Fork (17010201)+, Flint-Rock (17010202)+, Blackfoot (17010203)+, Middle Clark Fork (17010204)+, Bitterroot (17010205)+, North Fork Flathead (17010206)+, Middle Fork Flathead (17010207)+, Flathead Lake (17010208)+, South Fork Flathead (17010209)+, Stillwater (17010210)+, Swan (17010211)+, Lower Flathead (17010212)+, Lower Clark Fork (17010213)+, Pend Oreille Lake (17010214)+, Priest (17010215)+, Pend Oreille (17010216)+, Upper Coeur D'alene (17010301)+, South Fork Coeur D'alene (17010302)+, Coeur D'alene Lake (17010303)+, St. Joe (17010304)+, Upper Spokane (17010305)+, Lower Spokane (17010307)*, Little Spokane (17010308)+, Franklin D. Roosevelt Lake (17020001)*, Kettle (17020002)*, Colville (17020003)*, Sanpoil (17020004)*, Chief Joseph (17020005)*, Okanogan (17020006)*, Similkameen (17020007)*, Methow (17020008)*, Lake Chelan (17020009)*, Upper Columbia-Entiat (17020010)*, Wenatchee (17020011)*, Upper Yakima (17030001)*, Naches (17030002)*, Lower Yakima, Washington (17030003)*, Snake headwaters (17040101)+, Gros Ventre (17040102)+, Greys-Hobock (17040103)+, Upper Henrys (17040202)+, Lower Henrys (17040203)+, Teton (17040204)+, Beaver-Camas (17040214)+, Medicine Lodge (17040215)+, Birch (17040216)+, Big Lost (17040218)+, Big Wood (17040219)+, Camas (17040220)+, Little Wood (17040221)+, North and Middle Forks Boise (17050111)+, Boise-Mores (17050112)+, South Fork Boise (17050113)+, Lower Boise (17050114)+, Upper Malheur (17050116)+*, South Fork Payette (17050120)+, Middle Fork Payette (17050121)+, Payette (17050122)+, North Fork Payette (17050123)+, Weiser (17050124)+, Brownlee Reservoir (17050201)+, Burnt (17050202)+*, Powder (17050203)+, Hells Canyon (17060101)+, Imnaha (17060102)+, Lower Snake-Asotin (17060103)*, Upper Grande Ronde (17060104)+, Wallowa (17060105)+, Lower Grande Ronde (17060106)+, Lower Snake-Tucannon (17060107)*, Palouse (17060108)+, Upper Salmon (17060201)+, Pahsimeroi (17060202)+, Middle Salmon-Panther (17060203)+, Lemhi (17060204)+, Upper Middle Fork Salmon (17060205)+, Lower Middle Fork Salmon (17060206)+, Middle Salmon-Chamberlain (17060207)+, South Fork Salmon (17060208)+, Lower Salmon (17060209)+, Little Salmon (17060210)+, Upper Selway (17060301)+, Lower Selway (17060302)+, Lochsa (17060303)+, Middle Fork Clearwater (17060304)+, South Fork Clearwater (17060305)+, Clearwater (17060306)+, Upper North Fork Clearwater (17060307)+, Lower North Fork Clearwater (17060308)+, Middle Columbia-Lake Wallula (17070101)*, Walla Walla (17070102)+, Middle Columbia-Hood (17070105)*, Klickitat (17070106)*, Upper Deschutes (17070301)+*, Little Deschutes (17070302)+*, Lewis (17080002)*, Upper Cowlitz (17080004)*, Lower Cowlitz (17080005)*, Middle Fork Willamette (17090001)+*, Mckenzie (17090004)+*, Clackamas (17090011)+*, North Umpqua (17100301)+*, South Umpqua (17100302)+*, Upper Rogue (17100307)+*, Middle Rogue (17100308)+*, Lower Rogue (17100310)+*, Fraser (17110001)*, Strait of Georgia (17110002)*, Nooksack (17110004)*, Upper Skagit (17110005)*, Sauk (17110006)*, Lower Skagit (17110007)*, Stillaguamish (17110008)*, Snoqualmie (17110010)*, Puyallup (17110014)*, Nisqually (17110015)*, Skokomish (17110017)*, Dungeness-Elwha (17110020)*, Summer Lake (17120005)+*
18	Sprague (18010202)+*, Lost (18010204)+, Butte (18010205)+, Upper Klamath (18010206)+, Shasta (18010207)+, Upper Pit (18020002)+, Lower Pit (18020003)+, Mccloud (18020004)+, Sacramento headwaters (18020005)+, North Fork Feather (18020121)+, East Branch North Fork

	Feather (18020122)+, Cow Creek (18020151)+, Battle Creek (18020153)+, Clear Creek-Sacramento River (18020154)+, Big Chico Creek-Sacramento River (18020157)+, Butte Creek (18020158)+, Madeline Plains (18080002)+, Honey-Eagle Lakes (18080003)+, Southern Mojave (18100100)+*
19	Southeast Mainland (19010101)+, Ketchikan (19010102)+, Prince of Wales (19010103)+, Mainland (19010201)+, Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell Isla (19010202)+, Baranof-Chichagof Islands (19010203)+, Admiralty Island (19010204)+, Lower Iskut (19010205)+, Lynn Canal (19010301)+, Glacier Bay (19010302)+, Chilkat-Skagway Rivers (19010303)+, Taku River (19010304)+, Yakutat Bay (19010401)+

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: Wolf; a large dog-like mammal.
General Description: Largest of the wild dogs; total length to 205 cm, tail to 50 cm, nose pad averaging 31 mm or more in diameter; upper canine more than 12 mm in anteroposterior diameter at base and not extending below level of anterior mental foramen when lower jaw is in place; peleage varies from nearly black to white, some shade of gray in most areas; condylobasal length of skull 203-269 mm (Hall 1981).
Diagnostic Characteristics: Differs from the coyote in larger nose pad (greater than 1 inch vs. less than 1 inch), more rounded ears, larger anteroposterior diameter of upper canine at gum level (more than 11 mm vs. less than 11 mm), larger heel pad on forefoot (more than 1.25 inches vs. less than 1.25 inches), longer skull (more than 215 mm and 2.5 mm vs. less than 215 mm and 205 mm, for males and females, respectively), and relatively shorter canines (in coyote, tips of upper canines extend below level of anterior mental foramina when lower jaw is in place); also, gray wolf holds the tail high when running, coyote holds it low (see Hall 1981 and Hoffmeister 1986 for further details). In some parts of central and eastern North America, coyote approaches wolf in certain characteristics, due to interbreeding. Differs from the red wolf in larger size, longer skull (condylobasal length more than 213 mm and 203 mm vs. less than these measurements for males and females, respectively), and in certain features og the molars (see Hall 1981); however, the red wolf actually may be a coyote-gray wolf hybrid (see GTAXCOM for CANIS RUFUS). Differs from the domestic dog in generally larger size, broader nose pad, more massive skull with heavier teeth, rostrum relatively longer, supraoccipital shield larger and projecting farther posteriorly, front foot track longer and narrower (Hoffmeister 1986).
Reproduction Comments: Breeds late fall/early winter in south, February-March in north. Gestation lasts about 2 months. Young are born in March and early April in the south (Hoffmeister 1986), late April in northwestern Montana, late May-early June in Northwest Territories (Heard and Williams 1992). Litter size is 4-10 (average 6-7); 1 litter/year. Only the dominant male/female mate and rear offspring. Pups emerge from the den in about 3 weeks. Pups are weaned in 50 days (also reported as 5 weeks). Young and parents vacate the den when young are about 3 months old (Hoffmeister 1986). Some offspring remain with the pack, others disperse as they mature. Breeding first occurs in the second or third year (Hoffmeister 1986). Lone wolves generally do not successfully rear young, but they may if food is abundant (Boyd and Jimenez, 1994, J. Mamm. 75:14-17).
Ecology Comments: Territorial throughout the year in most areas (but see Migration/Mobility comments). Packs consist of one or more family groups (generally 2-8 members, up to 21) with dominance hierarchy. In the Glacier National Park area, packs generally include 8-12 individuals (Bangs and Fritts 1993). Not uncommonly solitary; lone wolves may move through territories of established packs (e.g., see Thurber and Peterson 1993).

Population density is low; at Isle Royale National Park, Michigan, peak density was 9/100 sq km. Population density on Isle Royale followed trends in food supply (moose), with lag of 2-3 years (Peterson and Page 1988).

Generally wolves are not instrumental in causing prey declines; effect varies with other circumstances. In Quebec, winter weather appeared to affect deer population trend more than did wolf predation (Potvin et al. 1992). In south-central Alaska, wolf predation may have limited caribou recruitment (Bergerud and Ballard 1988), though winter starvation also was proposed as a significant poplation control. May take livestock as secondary prey when deer fawns (the primary summer prey) are less vulnerable due to better prenatal nutrition resulting from mild winter (USFWS 1990). In Minnesota, snow-induced changes in deer distribution and mobility resulted in changes in wolf movement patterns, sociality, and feeding behavior (when snow was shallow, wolves traveled farther and more often, spent less time with pack members, and used conifer cover less and killed fewer deer there) (Fuller 1991).
Non-Migrant: Y

Locally Migrant: N
Long Distance Migrant: N
Mobility and Migration Comments: Wolves in far northwestern North America may move as required to remain with migratory caribou.

Home ranges very large but very variable as well, generally ranging from less 100 to 10,000s of square kilometers. In Minnesota, Fritts and Mech (1981) found territory sizes ranging from 195 to 555 square kilometers; in south to central Alaska, Ballard et al. (1987) reported territory sizes from 943 to 2541 square kilometers; in the southern Yukon, Hayes (1992) found territory sizes of 583 to 794 km square kilometers; in the Kenai Peninsula, Alaska, Peterson et al. (1984) found average territory sizes of 638 square kilometers; and in coastal forests of Vancouver Island, Atkinson and Janz (1994) found territory sizes from 100 to 400 square kilometers. Packs that depend on barren ground caribou migrate with the caribou as far as 360 km (Kuyt 1972; Mech 1970, 1974). In the Glacier National Park area, territory size averages around 780 sq km (Bangs and Fritts 1993).

In the Northwest Territories and western Nunavut, Walton et al. (2001) fitted 23 wolves in 19 different packs with collar-mounted satellite transmitters. Annual home-range sizes (95% minimum convex polygon) averaged 63,058 sq km for males and 44,936 sq km for females. Straight-line distances from the most distant location on the winter range to the den site averaged 508 km in 1997-1998 and 265 km in 1998-1999 (wolves followed caribou). All but 2 of 15 wolves returned to within 25 km of a previous den, and 2 wolves returned to the same den site.

Dispersing young may move several hundred kilometers. In Minnesota, most dispersers left when they were 11-12 months old; dispersal occurred mainly in February-April and October-November; 35% of known-age wolves remained in their natal territory for more than 2 years (Gese and Mech 1991).

Terrestrial Habitat(s): Alpine, Desert, Forest - Conifer, Forest - Hardwood, Forest - Mixed, Grassland/herbaceous, Savanna, Shrubland/chaparral, Tundra, Woodland - Conifer, Woodland - Hardwood, Woodland - Mixed
Special Habitat Factors: Burrowing in or using soil
Habitat Comments: No particular habitat preference. In Minnesota and Wisconsin, usually occurs in areas with few roads, which increase human access and incompatible land uses (Thiel 1985, Mech et al. 1988, Mech 1989) but apparently can occupy semi-wild lands if ungulate prey are abundant and if not killed by humans (see Mladenoff et al. 1997). Minimum of 10,000-13,000 sq km (with low road density) might be necessary to support a viable population (USFWS 1990); a single pack does not constitute a "minimum viable population" (USFWS 1990). Young are born in an underground burrow that has been abandoned by another mammal or dug by wolf. In Northwest Territories, dens were most commonly located witin 50 km of northern tree line, which resulted in maximal availability of caribou during the denning and pup rearing period; within the tundra zone, dens were not preferentially located near caribou calving grounds (Heard and Williams 1992). In Minnesota, dens usually were not near territory boundaries; den use was traditional in most denning alpha females studied for more than 1 year; possibly the availability of a stable food supply source helped determine den location (Ciucci and Mech 1992).
Adult Food Habits: Carnivore
Immature Food Habits: Carnivore
Food Comments: Predominant prey: ungulates. When these are low or seasonally unavailable, eats alternative prey, such as beaver, snowshoe hare, rodents, and carrion. Commonly hunts in packs, but lone wolves and pairs are able to kill prey as large as adult moose (Thurber and Peterson 1993). In the vicinity of Glacier National Park, feeds primarily on white-tailed deer; sometimes kills mountain lions and sometimes usurps ungulate prey killed by lions (Bangs and Fritts 1993). White-tailed deer and moose carrion were the primary prey in southern Ontario (Forbes and Theberge 1996).
Adult Phenology: Crepuscular, Nocturnal
Immature Phenology: Crepuscular, Nocturnal
Phenology Comments: Mainly nocturnal. In fall-winter in Minnesota, spends most of time sleeping, resting, or traveling, little time feeding (Mech, 1992, J. Mamm. 73:570-571). In south-central Alaska, den site activity was mainly nocturnal; there was a high probability that groups of wolves would be present at the den at midday (Ballard et al., 1991, Can. Field-Nat. 105:497-

Economic Attributes Expand

Management Summary Expand

Population/Occurrence Delineation Expand

Population/Occurrence Viability Expand

U.S. Invasive Species Impact Rank (I-Rank) Not yet assessed

Authors/Contributors Expand

References Expand

Use Guidelines & Citation Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Cicindela denikei - Brown, 1934
Laurentian Tiger Beetle
Taxonomic Status: Accepted
Related ITIS Name(s): *Cicindela denikei* Brown, 1934 (TSN 697684)
Unique Identifier: ELEMENT_GLOBAL.2.119130
Element Code: IICOL026M0
Informal Taxonomy: Animals, Invertebrates - Insects - Beetles - Tiger Beetles

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Search for Images on Google

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Mandibulata	Insecta	Coleoptera	Cicindelidae	Cicindela

Genus Size: D - Medium to large genus (21+ species)

Check this box to expand all report sections: ☐

Concept Reference

Expand

Conservation Status

Collapse

NatureServe Status

Global Status: G3G4
Global Status Last Reviewed: 04Jun2008
Global Status Last Changed: 25Nov2002
Rounded Global Status: G3 - Vulnerable
Reasons: While this species has a limited range, it does not appear to be rare within it, although it does have rather specific edaphic requirements. Previous iterations of this database have ranked this taxon as G4, which seems likely to be its rank when more data are assembled. However, based on what is currently known this species is not imminently imperiled (G1 or G2) nor so widespread and common as to merit demonstrably secure (G5), but better information would be needed to determine a confident global rank. This species has a small range and may well be secure in much of it, but at present information on number and viability of occurrences is inadequate to rule out a status of globally uncommon (= G3). No other rank seems likely. Information on the number of defensible or secure occurrences, using the rank specifications for this group or any other reasonable definitions, is not available.
Nation: United States
National Status: NNR
Nation: Canada
National Status: N4 (08May2013)

U.S. & Canada State/Province Status	
United States	Minnesota (S2)

Canada	Manitoba (S4), Ontario (S3S4)

Other Statuses

NatureServe Global Conservation Status Factors

Range Extent: 5000-200,000 square km (about 2000-80,000 square miles)
Range Extent Comments: A somewhat limited range in boreal forest regions along the southern boundary of Manitoba and Ontario then southeast along, but mostly north of, the Ontario-Minnesota border (Pearson et al., 2006). According to Robert Dana recent inventory shows a somewhat larger range for Minnesota that that mapped by Pearson *et al.* (1997). From the map in Pearson et al. (2006) the range is rather linear and less than 500 kilometers long, not reaching Lake Superior, and on average perhaps 50 km wide.

Area of Occupancy: Unknown 4-km2 grid cells
Area of Occupancy Comments:

Number of Occurrences: 21 - 300
Number of Occurrences Comments: Only a best guess. There are few real data, in particular few data relevant to distinguishing localities as demes or separate occurrences. However this species is generally regarded as fairly common within its limited range. For example Robert Dana (telephone communication to Dale Schweitzer on November 27, 2002) points out that recent surveys have found it around many gravel pits within its Minnesota range.

Population Size: Unknown

Number of Occurrences with Good Viability/Integrity: Unknown what number of occurrences with good viability

Environmental Specificity: Narrow. Specialist or community with key requirements common.
Environmental Specificity Comments: Requires very specific edaphic conditions that occur locally throughout its range.

Intrinsic Vulnerability: Moderately vulnerable

Short-term Trend: Unknown
Short-term Trend Comments: Lack of published statements to the contrary suggests this taxon is not in any major decline. Tiger beetles are popular with collectors and any major decline would probably be noticed. Also the recent Minnesota inventory work does not point to a decline.

Long-term Trend: Unknown

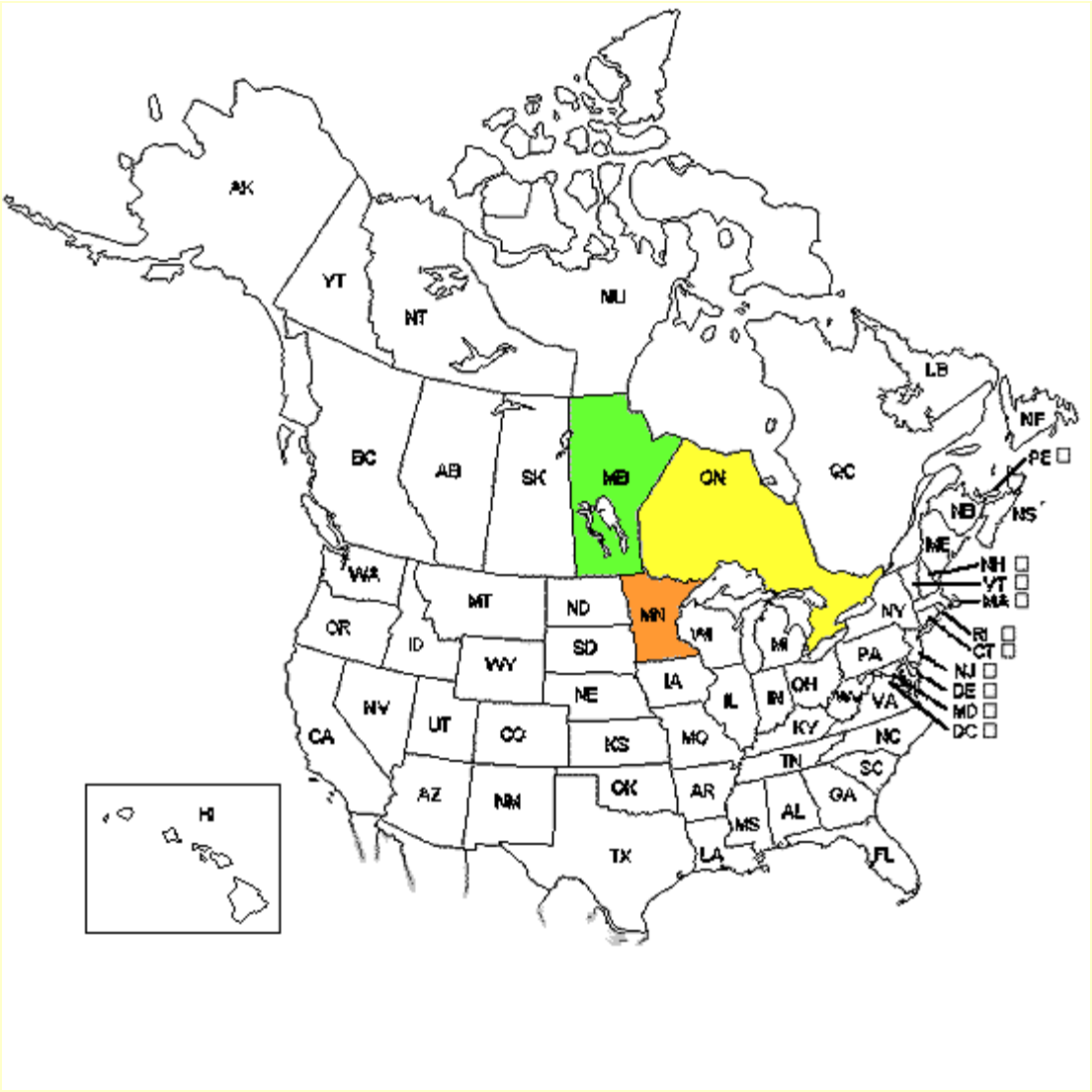
Other NatureServe Conservation Status Information

Distribution

Collapse

Global Range: (5000-200,000 square km (about 2000-80,000 square miles)) A somewhat limited range in boreal forest regions along the southern boundary of Manitoba and Ontario then southeast along, but mostly north of, the Ontario-Minnesota border (Pearson et al., 2006). According to Robert Dana recent inventory shows a somewhat larger range for Minnesota that that mapped by Pearson *et al.* (1997). From the map in Pearson et al. (2006) the range is rather linear and less than 500 kilometers long, not reaching Lake Superior, and on average perhaps 50 km wide.

U.S. States and Canadian Provinces



State/Province Conservation Status

- SX: Presumed Extirpated
- SH: Possibly Extirpated
- S1: Critically Imperiled
- S2: Imperiled
- S3: Vulnerable
- S4: Apparently Secure
- S5: Secure
- Not Ranked/Under Review (SNR/SU)

Conservation Status Not Applicable (SNA)

- Exotic
- Hybrid without Conservation Value

Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	MN
Canada	MB, ON

Range Map
No map available.

U.S. Distribution by County	
State	**County Name (FIPS Code)**
MN	Cook (27031), Koochiching (27071), Lake (27075), Lake of the Woods (27077), St. Louis (27137)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
09	Rainy Headwaters (09030001)+, Vermilion (09030002)+, Rainy Lake (09030003)+, Little Fork (09030005)+, Lower Rainy (09030008)+, Lake of the Woods (09030009)+

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History — Collapse

Non-Migrant: N
Locally Migrant: N
Long Distance Migrant: N
Terrestrial Habitat(s): Forest - Conifer, Forest - Mixed, Woodland - Conifer, Woodland - Mixed
Habitat Comments: This species is restricted to sandy, gravelly soils in grainte outcroppings in boreal coniferous forest in a very limited area. Larval burrows are usually under a flat rock.
Phenology Comments: Adults have been found from May to August, but mostly in June and July.

Economic Attributes — Not yet assessed

Management Summary — Not yet assessed

Population/Occurrence Delineation — Expand

Population/Occurrence Viability — Expand

U.S. Invasive Species Impact Rank (I-Rank) — Not yet assessed

Authors/Contributors — Expand

References — Expand

Use Guidelines & Citation — Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Coturnicops noveboracensis - (Gmelin, 1789)

Yellow Rail

Taxonomic Status: Accepted
Related ITIS Name(s): *Coturnicops noveboracensis* (Gmelin, 1789) (TSN 176259)
French Common Names: râle jaune
Spanish Common Names: Polluela Amarilla
Unique Identifier: ELEMENT_GLOBAL.2.100233
Element Code: ABNME01010
Informal Taxonomy: Animals, Vertebrates - Birds - Other Birds

© Larry Master

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Aves	Gruiformes	Rallidae	Coturnicops

Genus Size: B - Very small genus (2-5 species)

Check this box to expand all report sections: ☐

Concept Reference

Expand

Conservation Status

Collapse

NatureServe Status

Global Status: G4
Global Status Last Reviewed: 25Nov1996
Global Status Last Changed: 25Nov1996
Rounded Global Status: G4 - Apparently Secure
Reasons: Widespread distribution centered in south-central and southeastern Canada; apparently rather rare in most areas, though this is partly because of difficulty in detection; known to be fairly common in some areas; evidently declining in some areas where habitat destruction is ongoing, but there are some significant areas of protected habitat.
Nation: United States
National Status: N3B,N4N (05Jan1997)
Nation: Canada
National Status: N4B (13Feb2012)

U.S. & Canada State/Province Status	
United States	Alabama (S2N), Arkansas (SNA), California (S1S2), District of Columbia (SHN), Florida (SNA), Georgia (S3?), Illinois (SXB,S2N), Indiana (SNA), Iowa (SNA), Kansas (SNA), Kentucky (SNA), Louisiana (S3S4N), Massachusetts (S1N), Michigan (S1S2), Minnesota (S3B), Mississippi (S2N), Missouri (SU), Montana (S3B), Nebraska (SNRN), New Jersey (SNRN), New York (SNRN), North Carolina (S2N), North Dakota (S2), Ohio (SX), Oregon (S1B), South Dakota (SUB), Texas (S3N), Virginia (SNRN), Wisconsin (S1B)

Canada	Alberta (SU), British Columbia (S2B), Manitoba (S3S4B), New Brunswick (S1?B), Northwest Territories (S2B), Ontario (S4B), Quebec (S2S3B), Saskatchewan (S3B,S2M)

Other Statuses

Canadian Species at Risk Act (SARA) Schedule 1/Annexe 1 Status: SC (05Jun2003)
Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Special Concern (27Nov2009)
Comments on COSEWIC: Relatively little is known about this small, secretive rail. It is primarily restricted to shallow, dense, grassy marshes and wet meadows. Most of its breeding range (about 90%) is in Canada. It is relatively uncommon in most areas; populations are most widespread and common in coastal areas of Hudson and James Bay in northern Manitoba, Ontario and Quebec. It winters in shallow marshes that occur in a narrow band extending from Texas to the Carolinas. The species is close to meeting some criteria for Threatened status because of its relatively small population size, compressed wintering range, ongoing threats to breeding and wintering wetland habitats, and evidence for local declines in several parts of its breeding range.

Designated Special Concern in April 1999. Status re-examined and confirmed in November 2001 and in November 2009.
IUCN Red List Category: LC - Least concern

NatureServe Global Conservation Status Factors

Range Extent: 20,000-2,500,000 square km (about 8000-1,000,000 square miles)
Range Extent Comments: BREEDING: locally from northwestern Alberta to central Saskatchewan, Manitoba, northern New York (Gibbs, pers. comm.), Maine, and New Brunswick, south to southern Alberta, northeastern Montana, North Dakota, Michigan, southern Wisconsin, northern Minnesota, southern Ontario, and New England; formerly south to southern Ohio and northern Illinois (Bookhout 1995). Nested formerly in eastern California, where current nesting is a possibility. Recently rediscovered nesting in southern Oregon (Stern et al. 1993). Formerly occurred in State of Mexico, Rio Lerma Valley (subspecies GOLDMANI) where last reported in 1964 (Bookhout 1995). NON-BREEDING: mostly on Coastal Plain in southeastern U.S. from Texas to North Carolina; scattered records in California from Humboldt to Riverside Counties (Bookhout 1995).

Number of Occurrences: 81 to >300
Number of Occurrences Comments: Difficult to estimate due to rail's secretive nature, but a total of more than 150 EOs were reported from the five states and provinces that provided this information in a 1993 survey. It is likely that there are many more EOs in territories that did not respond (e.g., Manitoba and Saskatchewan). Species is likely highly under-detected. Many new records in Minnesota as a result of intensive county inventories suggest that the scant records prior to these inventories were due to lack of detection.

Population Size: 2500 - 10,000 individuals
Population Size Comments: Probably more abundant than present records indicate.

Overall Threat Impact Comments: The major threats are nesting habitat destruction due to coastal development, natural succession, and wetland destruction. The breeding grounds are used for hay and pastures. Light agricultural use is beneficial, whereas intensive grazing removes needed cover. Hunting is a threat of unknown dimensions, especially in the mid-Atlantic coastal zone (Gibbs, pers. comm.). In Minnesota, habitat is threatened by agriculture and gamebird management activities (Coffin and Pfannmuller 1988). The timing of flooding for waterfowl management differs from the natural flooding cycle of the migratory habitat of the rails (Rundle and Fredrickson 1981). Johnson and Dinsmore (1986) reported that waterfowl management can be compatible with breeding rails. In Mississippi, urbanization, development of the coastal zone, and stream alteration projects have lowered the water table and destroyed marshes.
In Illinois, a public viewing area used once a week by humans 229 m from a rookery did not cause any overt responses from nesting birds (DeMauro 1993). See Vos (1984) for information on response to human disturbance in Colorado. Predators may include the red fox (VULPES VULPES), mink (MUSTELA spp), raccoon (PROCYON LOTOR), snakes, turtles, crows (CORVUS spp), gulls (LARUS spp), hawks, owls, eagles, rats, opossum (DIDELPHIS VIRGINIANA), striped skunk (MEPHITIS MEPHITIS), river otter (LUTRA CANADENSIS), coyote (CANIS LATRANS) and bobcat (LYNX RUFUS).

Short-term Trend: Decline of 10-30%

Short-term Trend Comments: Information on population trends and historic data is scant due to difficulty of detecting birds. Becoming rare in some parts of its range, but is still common in others. Declining in North Dakota and Mississippi.

Other NatureServe Conservation Status Information

Inventory Needs: Determine current distribution, abundance, and population trend, especially in prairie states and coastal areas.

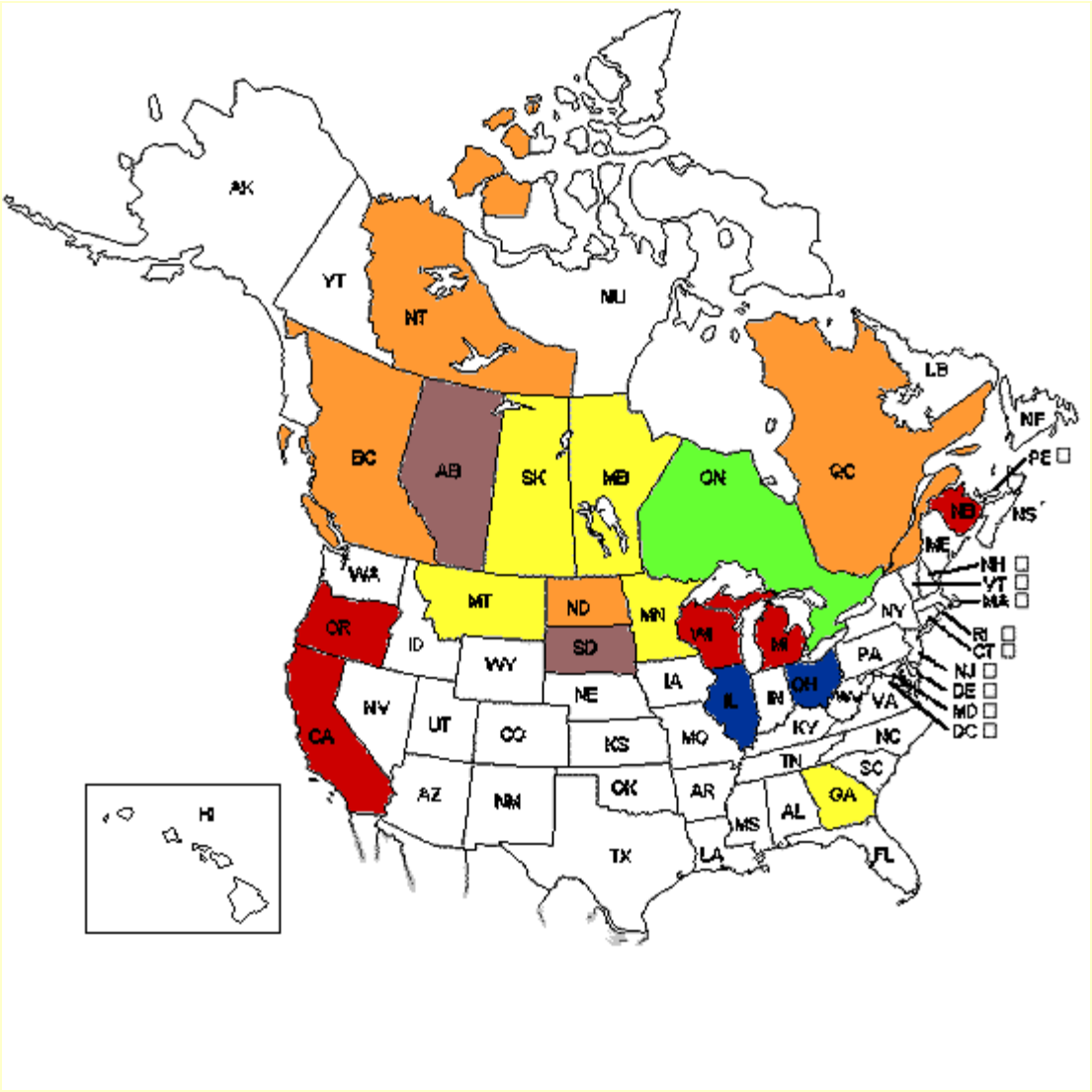
Protection Needs: Protect remaining habitat, especially coastal marshes and prairie pothole marshes. Discourage stream alteration projects that lower the water table in wetland rail habitat. Eddleman et al. (1988) made the following protection recommendations for North American rallids: enforce the 1985 Farm Act to protect wetlands from agricultural damage; accelerate U.S. Fish and Wildlife Service acquisition of wetlands with high elevational diversity and high percentage of emergent vegetation; resume congressional funding of the Accelerated Research Program for Migratory and Upland Game Birds that funds research on habitat management; institute a U.S. Fish and Wildlife Service hunting stamp for hunting rails and migratory game birds other than waterfowl to facilitate data collection and promote habitat protection.

Distribution

Collapse

Global Range: (20,000-2,500,000 square km (about 8000-1,000,000 square miles)) BREEDING: locally from northwestern Alberta to central Saskatchewan, Manitoba, northern New York (Gibbs, pers. comm.), Maine, and New Brunswick, south to southern Alberta, northeastern Montana, North Dakota, Michigan, southern Wisconsin, northern Minnesota, southern Ontario, and New England; formerly south to southern Ohio and northern Illinois (Bookhout 1995). Nested formerly in eastern California, where current nesting is a possibility. Recently rediscovered nesting in southern Oregon (Stern et al. 1993). Formerly occurred in State of Mexico, Rio Lerma Valley (subspecies GOLDMANI) where last reported in 1964 (Bookhout 1995). NON-BREEDING: mostly on Coastal Plain in southeastern U.S. from Texas to North Carolina; scattered records in California from Humboldt to Riverside Counties (Bookhout 1995).

U.S. States and Canadian Provinces



State/Province Conservation Status

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- S1: Critically Imperiled
- S2: Imperiled
- S3: Vulnerable
- S4: Apparently Secure
- S5: Secure
- Not Ranked/Under Review (SNR/SU)

Conservation Status Not Applicable (SNA)

- Exotic
- Hybrid without Conservation Value

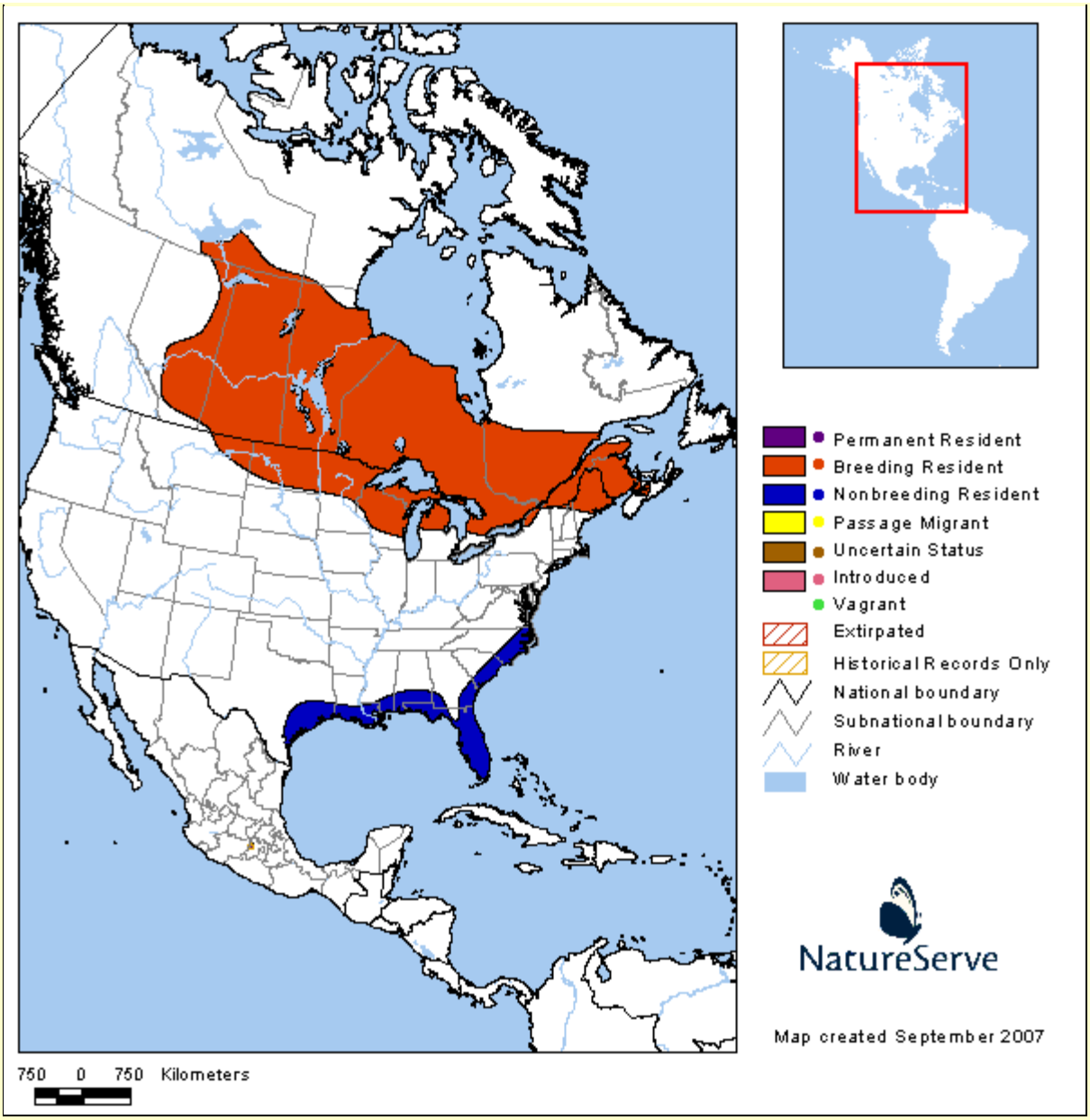
NOTE: The maps for birds represent the breeding status by state and province. In some jurisdictions, the subnational statuses for common species have not been assessed and the status is shown as not-assessed (SNR). In some jurisdictions, the subnational status refers to the status as a non-breeder; these errors will be corrected in future versions of these maps. A species is not shown in a jurisdiction if it is not known to breed in the jurisdiction or if it occurs only accidentally or casually in the jurisdiction. Thus, the species may occur in a jurisdiction as a seasonal non-breeding resident or as a migratory transient but this will not be indicated on these maps. See other maps on this web site that depict the Western Hemisphere ranges of these species at all seasons of the year.

Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	AL, AR, CA, DC, FL, GA, IA, IL, IN, KS, KY, LA, MA, MI, MN, MO, MS, MT, NC, ND, NE, NJ, NY, OH, OR, SD, TX, VA, WI
Canada	AB, BC, MB, NB, NT, ON, QC, SK

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: WILDSPACETM 2002

U.S. Distribution by County	
State	**County Name (FIPS Code)**
CA	Merced (06047)*
MI	Alger (26003), Chippewa (26033), Luce (26095)*, Mackinac (26097), Roscommon (26143), Schoolcraft (26153)*
MN	Aitkin (27001), Becker (27005), Beltrami (27007), Benton (27009)*, Cass (27021), Clay (27027), Clearwater (27029), Cook (27031), Crow Wing (27035)*, Itasca (27061), Kanabec (27065), Kittson (27069), Lake of the Woods (27077), Mahnomen (27087), Marshall (27089), Mille Lacs (27095), Morrison (27097), Norman (27107), Otter Tail (27111), Pennington (27113), Pine (27115), Polk (27119), Roseau (27135), Sherburne (27141)*, St. Louis (27137), Stearns (27145)*, Todd (27153), Wadena (27159), Wilkin (27167)
MO	Chariton (29041), Holt (29087), Lincoln (29113), Livingston (29117), Pike (29163), Stoddard (29207), Wayne (29223)
MS	Forrest (28035)*, Harrison (28047), Jackson (28059), Lamar (28073)*, Pearl River (28109)*, Stone (28131)*
MT	Roosevelt (30085)*, Sheridan (30091)

ND	Benson (38005), Burke (38013), Grand Forks (38035), McHenry (38049), Mountrail (38061), Sheridan (38083), Stutsman (38093)
OR	Klamath (41035), Lake (41037)
SD	Faulk (46049)
WI	Ashland (55003), Barron (55005), Bayfield (55007), Burnett (55013), Calumet (55015), Chippewa (55017), Door (55029), Douglas (55031), Forest (55041), Langlade (55067), Marinette (55075), Marquette (55077), Monroe (55081), Oconto (55083), Oneida (55085), Sawyer (55113), Vilas (55125)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed

Watershed Region	Watershed Name (Watershed Code)
03	Pascagoula (03170006)+*, Black (03170007)+*, Mississippi Coastal (03170009)+, Lower Pearl. Mississippi (03180004)+*
04	Baptism-Brule (04010101)+, St. Louis (04010201)+, Beartrap-Nemadji (04010301)+, Bad-Montreal (04010302)+, Betsy-Chocolay (04020201)+*, Manitowoc-Sheboygan (04030101)+, Door-Kewaunee (04030102)+, Oconto (04030104)+, Peshtigo (04030105)+, Upper Fox (04030201)+, Wolf (04030202)+, Muskegon (04060102)+, Manistique (04060106)+, St. Marys (04070001)+, Carp-Pine (04070002)+
07	Mississippi Headwaters (07010101)+, Leech Lake (07010102)+, Prairie-Willow (07010103)+, Elk-Nokasippi (07010104)+, Pine (07010105)+, Crow Wing (07010106)+, Redeye (07010107)+, Long Prairie (07010108)+, Platte-Spunk (07010201)+, Clearwater-Elk (07010203)+*, Rum (07010207)+, Upper St. Croix (07030001)+, Snake (07030004)+, Lower St. Croix (07030005)+, Upper Chippewa (07050001)+, Flambeau (07050002)+, Lower Chippewa (07050005)+, Red Cedar (07050007)+, Upper Wisconsin (07070001)+, Castle Rock (07070003)+, The Sny (07110004)+, Salt (07110007)+
08	Lower St. Francis (08020203)+
09	Lower Souris (09010003)+, Upper Red (09020104)+, Buffalo (09020106)+, Eastern Wild Rice (09020108)+, Devils Lake (09020201)+, Upper Sheyenne (09020202)+, Sandhill-Wilson (09020301)+, Red Lake (09020303)+, Thief (09020304)+, Clearwater (09020305)+, Grand Marais-Red (09020306)+, Turtle (09020307)+, Snake (09020309)+, Lower Red (09020311)+, Two Rivers (09020312)+, Roseau (09020314)+, Big Fork (09030006)+, Rapid (09030007)+, Lake of the Woods (09030009)+
10	Big Muddy (10060006)+, Brush Lake closed basin (10060007)+, Lake Sakakawea (10110101)+, Apple (10130103)+, Snake (10160008)+, Tarkio-Wolf (10240005)+, Nodaway (10240010)+, Lower Grand (10280103)+
17	Little Deschutes (17070302)+, Summer Lake (17120005)+
18	Williamson (18010201)+, Sprague (18010202)+, Upper Klamath Lake (18010203)+, Middle San Joaquin-Lower (18040001)+*

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: A small marsh bird (rail).
General Description: A small buffy rail with very secretive habits (Peterson 1980). White wing patch noticeable in flight. Has a very short greenish bill and a striped, checkered back with buff and black (Peterson 1980). The male's bill turns black after the breeding season. Weight 50-55 g; 15 to 19 cm (6 to 7.5 inches) long; wingspan 25 to 33 cm (10 to 13 inches) (Evers 1990). Males are generally larger than females.

Both the male and female are capable of calling. The calls consist of a long, continued series of pairs and triplets of "ticks" (Savaloja 1981). The female has a variety of calls used when protecting young. A "rowr" is used when the nest is disturbed, a whining may be used to attract young, and moans may be given when brooding (Savaloja 1981). Males call during northward migration and females do not. During the pre-incubation period the males will give their calls nightly for hours, stopping for

only a few minutes each hour. Calling continues (at lower levels) during and after incubation but generally ends in mid-August.

The chicks have a pink bill and are black in color. The bill fades and eventually becomes black in its juvenile stage. Juveniles are darker than adults and have white barred breast areas and distinctive spots on the head. Young chicks and juveniles give various sounds described as "wees" and "peeps" (Savaloja 1981).

Diagnostic Characteristics: Small size; striped yellow and black above with small white crossbars; in flight shows a large white patch on trailing edges of wings; bill short and thick. Call is a four- or five-note tik-tik, tik-tik-tik, in alternate twos and threes (National Geographic Society 1999).

Reproduction Comments: Sexual activity usually takes place in the late morning hours. Lay six to ten eggs per clutch (Savaloja 1981, Brewer et al. 1991) with eight being the average. In Minnesota and North Dakota eggs are laid in late May and early June (Savaloja 1981). Incubation begins after the last egg is laid and lasts 13 to 20 days (Harrison 1979, Savaloja 1981). Female incubates and does not leave the nest at night during this time. Within one day of hatching the young leave the nest and are cared for by female. The young can feed on their own at 11 days (Stenzel 1983). Fledge at five weeks (Stahlhelm 1974). Renesting may occur if initial nests are destroyed or unsuccessful.

Ecology Comments: Male territories are an average of 7.8 ha (19 acres), and are established within one week of their arrival (Bookhout and Stenzel 1987). Territories may encompass multiple female activity areas. The activity areas used by females average 1.2 ha (3 acres) during pre-incubation, decreasing to 0.3 ha (0.7 acres) during incubation (Bookhout and Stenzel 1987). Adult birds are flightless for several weeks during molting (mid- to late August) (Savaloja 1981).

Non-Migrant: N

Locally Migrant: N

Long Distance Migrant: Y

Mobility and Migration Comments: Generally arrives on northern nesting range in March-April (Terres 1980).

Estuarine Habitat(s): Herbaceous wetland

Palustrine Habitat(s): Bog/fen, HERBACEOUS WETLAND, Riparian

Terrestrial Habitat(s): Cropland/hedgerow, Grassland/herbaceous

Habitat Comments: BREEDING: Emergent wetlands, grass or sedge marshes and wet meadows in freshwater situations. Some breeding territories in these wet meadows contain firm footing and only a few remnant pools of water (Berkey 1991). These areas can range from damp to 38 cm (15 inches) of water but the average depth used for nesting is 8 to 15 cm (3 to 6 inches) (Savaloja 1981). Choose shallow water habitats over deep marsh zones. The vegetation ranges in height from about 5 to over 60 cm (2 to over 24 inches). This variation depends on the area and the time of year. In Minnesota, nest in large marshes composed of mixed sedge and bulrush, with cattails in deeper areas (Hanowski and Niemi 1990). The largest populations in North Dakota are in fens (bogs) with thick, soft mats of dead vegetation (Berkey 1991). In Manitoba, the birds are found in small boggy areas (Savaloja 1981). In the Great Lakes Region, nearly exclusively associated with CAREX spp. (Evers 1990). In Michigan, nest sites predominantly among the sedge CAREX LASIOCARPA (Bart et al. 1984, Bookhout and Stenzel 1987, Brewer et al. 1991). In Maine, found in damp, low-lying areas with water depths of 5 to 10 cm (2 to 4 inches) in otherwise dried-out portions of floodplains with a senescent mat composed of previous year's sedge growth (Gibbs et al. 1991). Habitats in Maine contained low densities of sedge, rush, and grass stems compared to other areas. Birds will use freshly burned area for territories only if burned after they have arrived to the breeding area (Savaloja 1981). NON-BREEDING: grain fields in winter and when migrating. Winters in both freshwater and brackish marshes, as well as in dense, deep grass. During fall migration, will use many open habitats, from rice paddies to dry hayfields. Winters are spent in a variety of areas, including salt-marshes, grain fields, damp grassy meadows, and freshwater marshes. In the south, the bird winters in agricultural fields and occasionally in rice fields (Berkey 1991).

Adult Food Habits: Granivore, Herbivore, Invertivore

Immature Food Habits: Granivore, Herbivore, Invertivore

Food Comments: Reported foods include small snails, insects, seeds, grasses, and clover leaves (Terres 1980). Vegetation and invertebrates are the most common foods. Most of the feeding activity takes place during the daytime, and when searching for food in water the birds have been seen with their heads 1.5 inches under the water (Savaloja 1981). In Minnesota rails feed on the snail SUCCINEA RETUSA (Savaloja 1981). Adults will feed on snails and small invertebrates found in dry grass, and seeds, grasses, and clover leaves found in sedge marshes. When the young are being reared, snails are an important food resource.

Phenology Comments: Although rails call frequently throughout the day and extensively throughout the night, these birds are not actively nocturnal. During the nighttime they are sedentary. During the day they actively feed and do most of their nest-building. Migration occurs primarily during the night. In the fall the birds are silent and very difficult to locate, in the spring they

are much easier to find.
Length: 18 centimeters
Weight: 52 grams

Economic Attributes Expand

Management Summary Expand

Population/Occurrence Delineation Expand

Population/Occurrence Viability Expand

U.S. Invasive Species Impact Rank (I-Rank) Not yet assessed

Authors/Contributors Expand

References Expand

Use Guidelines & Citation Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Erebia mancinus - E. Doubleday, [1849]
Taiga Alpine
Synonym(s): *Erebia disa mancinus*
Taxonomic Status: Accepted
Related ITIS Name(s): *Erebia mancinus* E. Doubleday, 1849 (TSN 778129)
French Common Names: alpin boréal , alpin à ocelles rouges
Unique Identifier: ELEMENT_GLOBAL.2.110794
Element Code: IILEPN8140
Informal Taxonomy: Animals, Invertebrates - Insects - Butterflies and Moths - Butterflies and Skippers

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Search for Images on Google

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Mandibulata	Insecta	Lepidoptera	Nymphalidae	Erebia

Genus Size: D - Medium to large genus (21+ species)

Check this box to expand all report sections: ☐

Concept Reference
Expand

Conservation Status
Collapse

NatureServe Status

Global Status: G5
Global Status Last Reviewed: 16Aug2009
Global Status Last Changed: 30Sep1998
Rounded Global Status: G5 - Secure
Reasons: This butterfly, while local, is fairly common over a large portion of Canada and Alaska. It has no known large scale threats. At least hundreds of occurrences, some of them protected.
Nation: United States
National Status: N1 (30Sep1998)
Nation: Canada
National Status: N5 (12Sep2009)

U.S. & Canada State/Province Status	
United States	Minnesota (S3)
	Alberta (S5), British Columbia (S5), Labrador (S3?), Manitoba (SNR), Northwest Territories (SNR), Ontario (S3),

Canada	Quebec (S4), Saskatchewan (S5), Yukon Territory (S5)

Other Statuses

NatureServe Global Conservation Status Factors

Range Extent: >2,500,000 square km (greater than 1,000,000 square miles)
Range Extent Comments: Labrador to Alaska and south barely into Minnesota. Widespread from central Ontario westward.

Area of Occupancy: Unknown 4-km2 grid cells
Area of Occupancy Comments:

Number of Occurrences: > 300
Number of Occurrences Comments: No actual compilation but Layberry *et al*. (1998) map close to 200 known locations in Canada alone, which obviously would not be close to all occurrences.

Population Size: 10,000 to >1,000,000 individuals

Number of Occurrences with Good Viability/Integrity: Very many (>125) occurrences with good viability

Environmental Specificity: Narrow. Specialist or community with key requirements common.

Overall Threat Impact Comments: No known or suspected large scale threats although individual populations may face any of a varierty of threats like peat mining, draining, insecticides etc. Many populations are in very remote areas. Some are in Canadian parks.

Intrinsic Vulnerability: Unknown

Short-term Trend: Relatively stable (=10% change)

Long-term Trend: Increase of 10-25% to decline of 30%

Other NatureServe Conservation Status Information

Inventory Needs: Not a priority in most of the range given how common this species is. Any effort to find this species need to consider whether the species is biennial in the area.

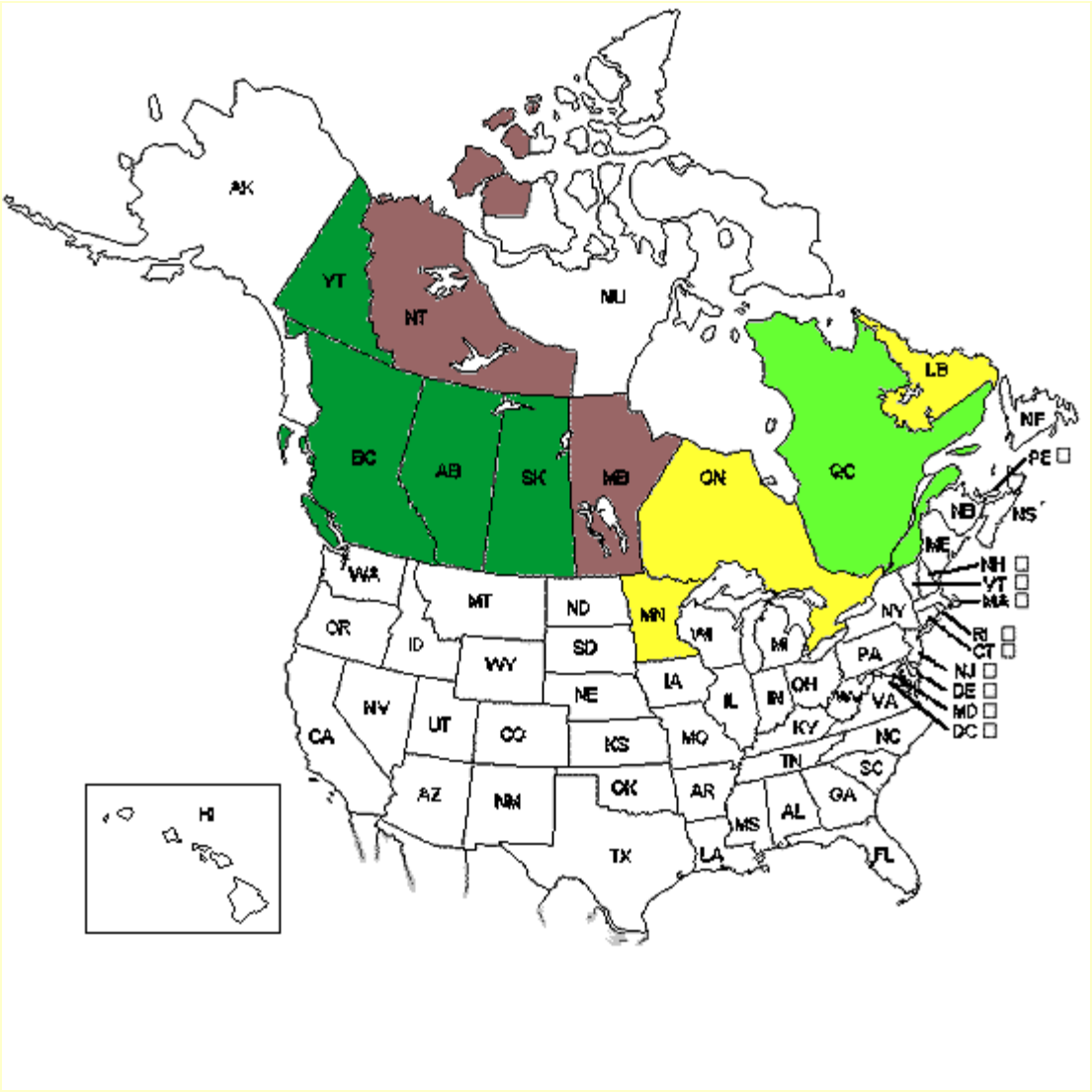
Protection Needs: In places like Minnesota where this species is considered of some conservation concern the primary need appears to be protection of the habitats.

Distribution

Collapse

Global Range: (>2,500,000 square km (greater than 1,000,000 square miles)) Labrador to Alaska and south barely into Minnesota. Widespread from central Ontario westward.

U.S. States and Canadian Provinces



State/Province Conservation Status

- SX: Presumed Extirpated
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Conservation Status Not Applicable (SNA)

- Exotic
- Hybrid without Conservation Value

Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	MN
Canada	AB, BC, LB, MB, NT, ON, QC, SK, YT

Range Map

No map available.

U.S. Distribution by County	
State	**County Name (FIPS Code)**
MN	Cook (27031)*, Lake (27075), St. Louis (27137)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
04	St. Louis (04010201)+, Cloquet (04010202)+
09	Rainy Headwaters (09030001)+

+ Natural heritage record(s) exist for this watershed

* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Non-Migrant: N
Locally Migrant: N
Long Distance Migrant: N
Palustrine Habitat(s): Bog/fen
Terrestrial Habitat(s): Woodland - Conifer
Habitat Comments: Black spruce or larch bogs and occasionally lodgepole pine woodland (Opler, 1999; Layberry et al., 1998)

Economic Attributes

Not yet assessed

Management Summary

Expand

Population/Occurrence Delineation

Expand

Population/Occurrence Viability

Expand

U.S. Invasive Species Impact Rank (I-Rank)

Not yet assessed

Authors/Contributors

Expand

References

Expand

Use Guidelines & Citation

Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Glyptemys insculpta - (Le Conte, 1830)
Wood Turtle
Synonym(s): *Clemmys insculpta* (Le Conte, 1830)
Taxonomic Status: Accepted
Related ITIS Name(s): *Glyptemys insculpta* (LeConte, 1830) (TSN 668669)
French Common Names: tortue des bois
Unique Identifier: ELEMENT_GLOBAL.2.100280
Element Code: ARAAD02020
Informal Taxonomy: Animals, Vertebrates - Turtles


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Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Chelonia	Cryptodeira	Emydidae	Glyptemys

Genus Size: B - Very small genus (2-5 species)

Check this box to expand all report sections: ☐

Concept Reference
Expand

Conservation Status
Collapse

NatureServe Status

Global Status: G3
Global Status Last Reviewed: 11Nov2010
Global Status Last Changed: 11Nov2010
Rounded Global Status: G3 - Vulnerable
Reasons: Occurs in the northeastern United States and portions of adjacent southern Canada; apparently declining throughout most of the range; still extant in all 21 states and Canadian provinces from which recorded but rated as apparently secure in only 2 states; late maturity and very low annual juvenile recruitment make the species vulnerable to declines and limit recovery potential; threatened by over-collection (commonly illegal) and habitat loss and fragmentation; better information is needed on population trends and their relationship to specific threats.
Nation: United States
National Status: N3 (11Nov2010)
Nation: Canada
National Status: N3 (28Dec2011)

U.S. & Canada State/Province Status

United States	Connecticut (S3), District of Columbia (SH), Iowa (S1), Maine (S4), Maryland (S4), Massachusetts (S3), Michigan (S2S3), Minnesota (S2), New Hampshire (S3), New Jersey (S2), New York (S3), Ohio (S1), Pennsylvania (S3S4), Rhode Island (S2), Vermont (S3), Virginia (S2), West Virginia (S2), Wisconsin (S3)
Canada	New Brunswick (S3), Nova Scotia (S3), Ontario (S2), Quebec (S2)

Other Statuses

Canadian Species at Risk Act (SARA) Schedule 1/Annexe 1 Status: T (23Feb2010)
Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Threatened (30Nov2007)
Comments on COSEWIC: Reason for Designation: This species is declining across much of its range, and occurs in small, increasingly disjunct populations. It is more terrestrial than other freshwater turtles, which makes it extremely vulnerable to collection for the pet trade. It has a long-lived life history typical of turtles, so that almost any chronic increase in adult and juvenile mortality leads to a decrease in abundance. Such increased mortality is occurring from increased exposure to road traffic, agricultural machinery and off-road vehicles, collection for pets, and perhaps exotic food/medicines. Increased level of threat is associated with new or increased access to areas by people.

Status History: Designated Special Concern in April 1996. Status re-examined and designated Threatened in November 2007.
IUCN Red List Category: EN - Endangered
Convention on International Trade in Endangered Species Protection Status (CITES): Appendix II

NatureServe Global Conservation Status Factors

Range Extent: 200,000-2,500,000 square km (about 80,000-1,000,000 square miles)
Range Extent Comments: Eastern North America, from Cape Breton Island, Nova Scotia, New Brunswick, and Quebec south to northern Virginia and Eastern Panhandle of West Virginia, west through the Great Lakes region (including southern Ontario) to eastern Minnesota, northeastern Iowa, and western Pennsylvania (Bleakney 1963, Gilhen and Grantmyer 1973, Green and Pauley 1987, Quinn and Tate 1991, Conant and Collins 1991, Harding 1997). Not known from Illinois or Indiana; occurrence in extreme northeastern Ohio was questioned as a possible native population (Conant 1975, Thompson 1953). See 1994 Herpetol. Rev. 25:144-146 for a discussion of occurrence on the coastal plain of Maryland.

Area of Occupancy: Unknown 4-km2 grid cells
Area of Occupancy Comments:

Number of Occurrences: 81 - 300
Number of Occurrences Comments: The number of occurrences has not been determined using standardized occurrence specifications, but probably there are at least a few hundred distinct occurrences.

Population Size: 10,000 - 100,000 individuals
Population Size Comments: Total adult population size is unknown but likely exceeds 10,000.

In the Great Lakes region, this species is generally uncommon to rare; locally common where habitat is intact and human disturbance is minimal (Harding 1997). It is rare in Minnesota and uncommon even in suitable habitat; populations are not large (Oldfield and Moriarty 1994). It is widespread but apparently rare in Maine (Hunter et al. 1992).

Number of Occurrences with Good Viability/Integrity: Many (41-125) occurrences with good viability
Viability/Integrity Comments: The number of occurrences with at least good viability has not been determined, but probably only a minority of occurrences have good long-term viability.

Environmental Specificity: Narrow. Specialist or community with key requirements common.

Overall Threat Impact: Very high - high
Overall Threat Impact Comments: The species has been seriously impacted by illegal collection. Entire populations along some streams have been eliminated. As a result, the distribution is now more discontinuous than it once was, and gene flow has certainly been reduced in some areas. Collection for pet trade (now illegal in most of the range) is the major threat to the survival of wood turtles. In the north, where development pressure is not great, collection may be the only serious threat.

Collectors can easily clean out an entire population along many miles of stream in only one or two seasons of collecting, by timing collection to coincide with the turtles' emergence from hibernation. Although the level of illegal collecting is undocumented, experts in most states surveyed mentioned collecting as a major threat in their state. Most states and provinces in the range now have laws prohibiting mass collection and commercial use. Nevertheless, it is not illegal to sell wood turtles in the rest of the United States, or to export them. They commonly show up in pet stores on the west coast, and they are also shipped to Japan and Europe. Hundreds to thousands of wood turtles arrive in Florida for world-wide distribution each spring (Harding, pers. comm.). Levell (2000) discussed commercial exploitation for the live animal trade. The wood turtle was recently listed in Appendix II of the CITES treaty, which will mean that permits will be required for export of the species (Brautigam, A., 1992, in litt. to J. Harding). The summary prepared for this listing (Inclusion of Clemmys insculpta in Appendix II United States of America Doc. 8.46: No. 51) indicated that "reviewers concur that protective legislation at state and provincial levels in the United States and Canada appears to have done little to curb collection of this species." One reviewer for the CITES listing indicated that specimen price lists only reveal a small fraction of the numbers actually sold, and that sale prices in Europe were reported to exceed US $100 (J. Harding). Another reviewer had been offered $35 per animal and had found selling prices of US $35-200 (R. Brooks). In this same document, reviewer J. Kaufmann reported that Canadian collectors had collected (illegally) several hundred specimens from one stream in Pennsylvania over a couple days time. Clearly, the selling price and apparent ease of collection will continue to put pressure on this species until sales are effectively regulated. The Chelonian Advisory Group of the American Association of Zoological Parks and Aquariums has adopted a resolution calling for a cessation of collection of CLEMMYS spp. from wild populations, and limitation of purchase to specimens proven to be captive-bred.

In contrast to the vulnerability to direct human exploitation, wood turtles are fairly tolerant of moderate habitat alterations. For instance, though wood turtles are generally associated with wooded streams, they generally feed along the margins of woods, or in openings, where preferred berries grow. Thus, some clearcutting adjacent to streams may not be harmful (Harding 1990). They are also tolerant of moderate development/disturbance, such as shoreline hunting cabins used only a few times a year, timber harvest, light grazing, and low-intensity agriculture (Harding 1997). On the other hand, intense use, such as high-use canoe put-ins and campgrounds generally result in absence of the turtles along such stretches of stream (Harding, pers. comm.). In Connecticut, two formerly stable wood turtle populations declined drastically after a protected drinking water supply area was opened to recreational use (Garber and Burger 1995). Presumably most of the turtles that disappeared were taken by people. In Quebec, "agricultural development may have resulted in reduced predation but also in reduced growth and recruitment, as well as increased adult mortality" (Saumure and Bider 1998).

Habitat destruction and fragmentation due to intense development and accompanying stream alterations are serious problems in the southeastern portion of the wood turtle's range, especially northern Virginia (Mitchell 1994), northwestern New Jersey, southeastern New York and eastern Pennsylvania. Similar problems exist in the Great Lakes region (Harding 1997). "Certain fisheries management practices, such as sand bank stabilization and the digging of sand traps in streams, can eliminate nesting sites and reduce preferred turtle habitat" (Harding 1997). With increasing development, adult mortality due to road traffic also increases (Harding 1997).

Another detrimental aspect of development and intense recreational use is increased egg predation by predators that coexist well with humans. For example, egg predators such as skunks and raccoons commonly increase in abundance with surrounding development and degradation of natural habitat. Although this turtle is apparently adapted to high egg mortality, predation rates elevated above "natural" rates may reduce reproductive success below critical replacement rates. Raccoons may also increase adult mortality. Farrell and Graham found 16.8% of wood turtles captured over a 4-year study to be injured, primarily by raccoons. Harding (1985) provided further information on predation and injuries.

Wood turtles are also intolerant of all types of water pollution. Wood turtles showed declines in some areas in the 1950s and 1960s, probably in response to increasing insecticide use.

Intrinsic Vulnerability: Highly to moderately vulnerable.
Intrinsic Vulnerability Comments: Population biology (late maturity, very low annual juvenile recruitment) limits recovery potential, and heightens vulnerability to over-collection. Low mobility (relative to birds, e.g.), and tendency to home, reduce probability of recolonization of decimated populations. These characteristics necessitate early response to indications of decline.

Short-term Trend: Decline of 30-70%
Short-term Trend Comments: Robust data on trend are not available for most occurrences, but available evidence indicates that this species is declining in many parts of its range, and trend is unknown but likely declining in most other areas. The species is not known to be stable or increasing in any substantial portion of the range. Decline in population size over the past three generations (which likely exceeds 50 years) probably has been substantial.

In the Great Lakes region, many local populations recently have been greatly reduced or extirpated by human activities (Harding 1997).

In southern Quebec, a local population in an agricultural area along the Sutton River declined by 50% over 7 seven years (Daigle and Jutras 2005).

Long-term Trend: Decline of 30-70%
Long-term Trend Comments: Long-term decline is primarily in abundance and condition of occurrences.

Other NatureServe Conservation Status Information

Inventory Needs: Range-wide surveys to assess status and document impact of commercial collection, especially in Pennsylvania and New York, in the heart of range, and Maine, where wood turtles have no state protection. Ongoing or planned inventories in West Virginia, Minnesota, Maryland, and Vermont.

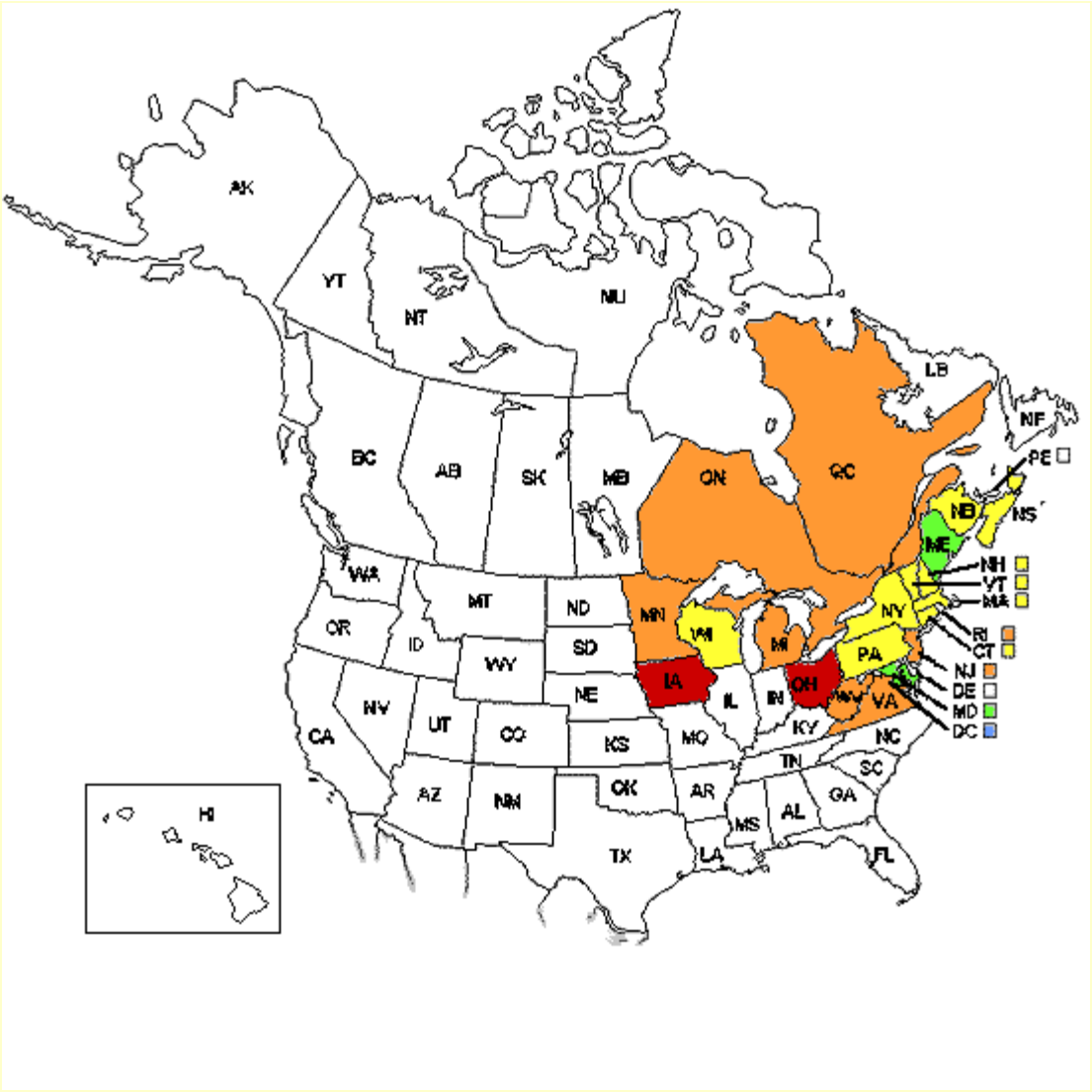
Protection Needs: Species was given CITES Appendix II protection in 1992, which means that permits will now be required for exports. State laws to protect from commercial collection needed in all states and provinces in range. Regulation of commercial sale also needed throughout USA. Also, habitat preservation, education, and moderation of recreational stream use.

Distribution

Collapse

Global Range: (200,000-2,500,000 square km (about 80,000-1,000,000 square miles)) Eastern North America, from Cape Breton Island, Nova Scotia, New Brunswick, and Quebec south to northern Virginia and Eastern Panhandle of West Virginia, west through the Great Lakes region (including southern Ontario) to eastern Minnesota, northeastern Iowa, and western Pennsylvania (Bleakney 1963, Gilhen and Grantmyer 1973, Green and Pauley 1987, Quinn and Tate 1991, Conant and Collins 1991, Harding 1997). Not known from Illinois or Indiana; occurrence in extreme northeastern Ohio was questioned as a possible native population (Conant 1975, Thompson 1953). See 1994 Herpetol. Rev. 25:144-146 for a discussion of occurrence on the coastal plain of Maryland.

U.S. States and Canadian Provinces

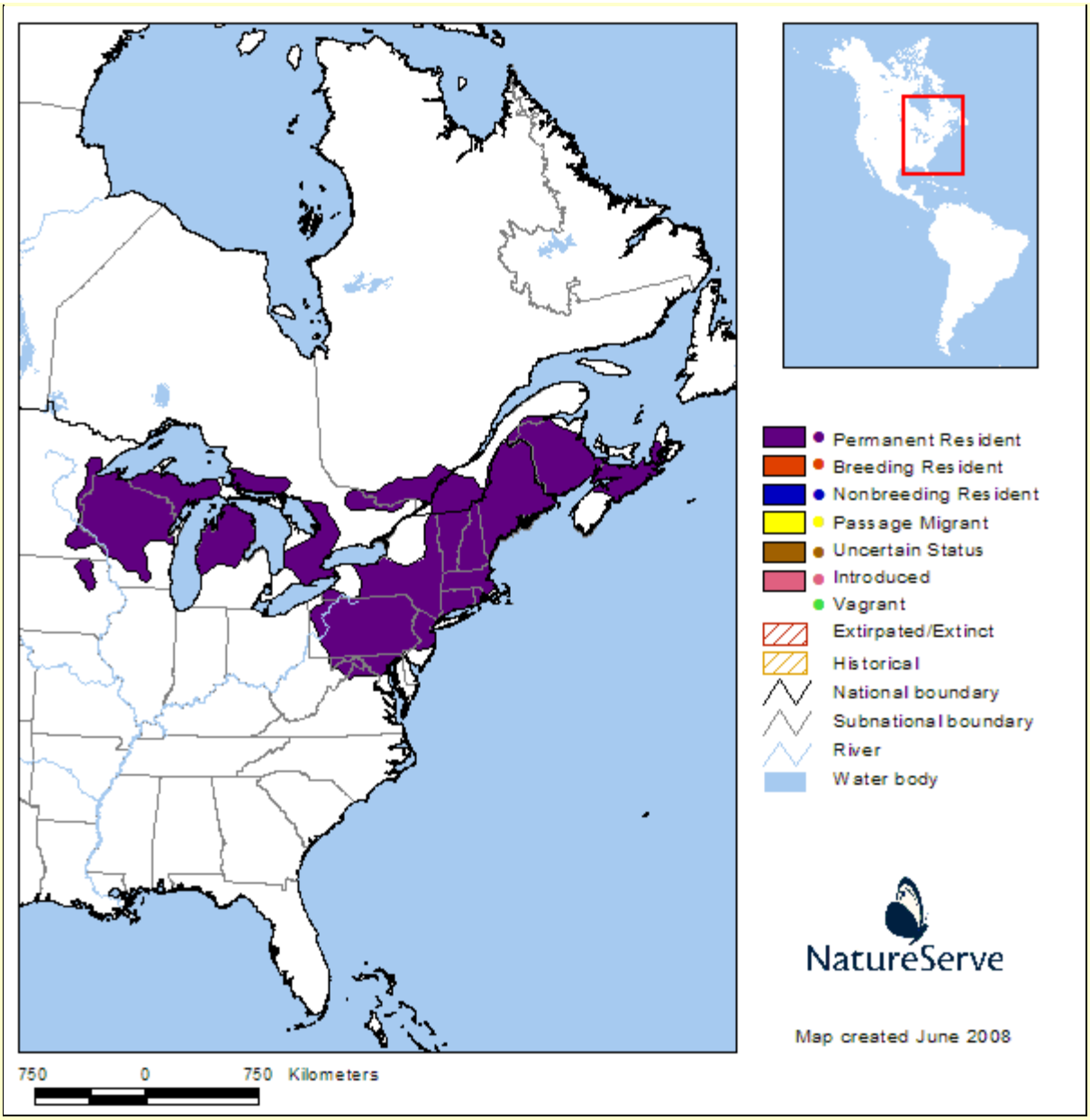


Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	CT, DC, IA, MA, MD, ME, MI, MN, NH, NJ, NY, OH, PA, RI, VA, VT, WI, WV
Canada	NB, NS, ON, QC

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: NatureServe 2008

U.S. Distribution by County	
State	**County Name (FIPS Code)**
CT	Fairfield (09001), Hartford (09003), Litchfield (09005), Middlesex (09007), New Haven (09009), New London (09011), Tolland (09013), Windham (09015)
IA	Benton (19011), Black Hawk (19013), Bremer (19017), Butler (19023), Cerro Gordo (19033), Chickasaw (19037), Delaware (19055), Floyd (19067), Franklin (19069), Iowa (19095), Keokuk (19107), Mitchell (19131), Washington (19183)
MA	Berkshire (25003), Bristol (25005), Essex (25009), Franklin (25011), Hampden (25013), Hampshire (25015), Middlesex (25017), Norfolk (25021), Plymouth (25023), Suffolk (25025)*, Worcester (25027)
ME	Androscoggin (23001), Aroostook (23003), Cumberland (23005), Franklin (23007), Hancock (23009), Kennebec (23011), Lincoln (23015), Oxford (23017), Penobscot (23019), Piscataquis (23021), Somerset (23025), Waldo (23027), Washington (23029), York (23031)
MI	Alcona (26001), Allegan (26005)*, Alpena (26007), Arenac (26011), Baraga (26013), Benzie (26019), Cheboygan (26031), Chippewa (26033), Clare (26035), Crawford (26039), Delta (26041), Dickinson (26043), Gladwin (26051), Gogebic (26053), Grand Traverse (26055), Houghton (26061),

	Ingham (26065)*, Iosco (26069), Iron (26071), Isabella (26073), Kalkaska (26079), Kent (26081), Lake (26085), Manistee (26101), Marquette (26103), Mason (26105), Mecosta (26107), Menominee (26109), Midland (26111), Missaukee (26113), Montcalm (26117), Montmorency (26119), Muskegon (26121), Newaygo (26123), Oceana (26127), Ogemaw (26129), Ontonagon (26131), Osceola (26133), Oscoda (26135), Otsego (26137), Presque Isle (26141), Roscommon (26143), Saginaw (26145)*, Schoolcraft (26153), Wexford (26165)
MN	Carlton (27017), Chisago (27025), Dakota (27037), Dodge (27039), Goodhue (27049), Isanti (27059), Lake (27075), Mille Lacs (27095), Mower (27099), Olmsted (27109), Pine (27115), Rice (27131), St. Louis (27137), Steele (27147), Wabasha (27157)
NH	Belknap (33001), Carroll (33003), Cheshire (33005), Coos (33007), Grafton (33009), Hillsborough (33011), Merrimack (33013), Rockingham (33015), Strafford (33017), Sullivan (33019)
NJ	Atlantic (34001)*, Bergen (34003), Burlington (34005), Camden (34007), Essex (34013), Gloucester (34015)*, Hudson (34017)*, Hunterdon (34019), Mercer (34021), Middlesex (34023), Monmouth (34025), Morris (34027), Ocean (34029), Passaic (34031), Somerset (34035), Sussex (34037), Union (34039), Warren (34041)
OH	Cuyahoga (39035)*
PA	Armstrong (42005), Berks (42011), Blair (42013), Bucks (42017), Butler (42019), Cameron (42023), Carbon (42025), Chester (42029), Columbia (42037), Cumberland (42041), Franklin (42055), Indiana (42063), Juniata (42067), Lebanon (42075), Lehigh (42077), Mifflin (42087), Monroe (42089), Montgomery (42091), Montour (42093), Northampton (42095), Perry (42099), Pike (42103), Schuylkill (42107), Snyder (42109), Venango (42121), Warren (42123)
RI	Kent (44003), Providence (44007), Washington (44009)
VA	Alexandria (City) (51510)*, Arlington (51013)*, Clarke (51043), Fairfax (51059), Frederick (51069), Loudoun (51107), Page (51139), Rockingham (51165), Shenandoah (51171), Warren (51187)
VT	Addison (50001), Bennington (50003), Chittenden (50007), Orange (50017), Rutland (50021), Washington (50023)
WI	Adams (55001)*, Ashland (55003), Barron (55005), Bayfield (55007), Brown (55009), Buffalo (55011), Burnett (55013), Chippewa (55017), Clark (55019), Columbia (55021), Crawford (55023), Douglas (55031), Dunn (55033), Eau Claire (55035), Florence (55037), Forest (55041), Grant (55043)*, Iowa (55049)*, Iron (55051), Jackson (55053), Juneau (55057), La Crosse (55063), Langlade (55067), Lincoln (55069), Marathon (55073), Marinette (55075), Menominee (55078), Monroe (55081), Oconto (55083), Oneida (55085), Outagamie (55087), Pepin (55091), Pierce (55093), Polk (55095), Portage (55097), Price (55099), Richland (55103), Rusk (55107), Sauk (55111), Sawyer (55113), Shawano (55115), St. Croix (55109), Taylor (55119), Trempealeau (55121), Vernon (55123), Vilas (55125), Washburn (55129), Waupaca (55135), Winnebago (55139)*, Wood (55141)
WV	Berkeley (54003), Grant (54023), Hampshire (54027), Hardy (54031), Jefferson (54037)*, Mineral (54057), Morgan (54065), Pendleton (54071)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
01	Upper St. John (01010001)+, Allagash (01010002)+, Fish (01010003)+, Aroostook (01010004)+, West Branch Penobscot (01020001)+, East Branch Penobscot (01020002)+, Mattawamkeag (01020003)+, Piscataquis (01020004)+, Lower Penobscot (01020005)+, Upper Kennebec (01030001)+, Dead (01030002)+, Lower Kennebec (01030003)+, Upper Androscoggin (01040001)+, Lower Androscoggin (01040002)+, St. Croix (01050001)+, Maine Coastal (01050002)+, St. George-Sheepscot (01050003)+, Presumpscot (01060001)+, Saco (01060002)+, Piscataqua-Salmon Falls (01060003)+, Merrimack (01070002)+, Nashua (01070004)+, Concord (01070005)+, Merrimack (01070006)+, Upper Connecticut (01080101)+, Upper Connecticut-Mascoma (01080104)+, White (01080105)+, Middle Connecticut (01080201)+, Miller (01080202)+, Deerfield (01080203)+, Chicopee (01080204)+, Lower Connecticut (01080205)+, Westfield (01080206)+, Farmington (01080207)+, Charles (01090001)+, Blackstone (01090003)+, Narragansett (01090004)+, Pawcatuck-Wood (01090005)+, Quinebaug (01100001)+, Shetucket (01100002)+, Thames (01100003)+, Quinnipiac (01100004)+,

	Housatonic (01100005)+, Saugatuck (01100006)+
02	Hudson-Hoosic (02020003)+, Rondout (02020007)+, Lower Hudson (02030101)+, Hackensack-Passaic (02030103)+, Sandy Hook-Staten Island (02030104)+, Raritan (02030105)+, Middle Delaware-Mongaup-Brodhead (02040104)+, Middle Delaware-Musconetcong (02040105)+, Lehigh (02040106)+, Crosswicks-Neshaminy (02040201)+, Lower Delaware (02040202)+, Schuylkill (02040203)+, Brandywine-Christina (02040205)+, Mullica-Toms (02040301)+, Great Egg Harbor (02040302)+*, Upper Susquehanna-Lackawanna (02050107)+, Sinnemahoning (02050202)+, Lower West Branch Susquehanna (02050206)+, Lower Susquehanna-Penns (02050301)+, Upper Juniata (02050302)+, Lower Juniata (02050304)+, Lower Susquehanna-Swatara (02050305)+, Lower Susquehanna (02050306)+, South Branch Potomac (02070001)+, North Branch Potomac (02070002)+, Cacapon-Town (02070003)+, Conococheague-Opequon (02070004)+, North Fork Shenandoah (02070006)+, Shenandoah (02070007)+, Middle Potomac-Catoctin (02070008)+, Middle Potomac-Anacostia-Occoquan (02070010)+
04	Beaver-Lester (04010102)+, St. Louis (04010201)+, Cloquet (04010202)+, Beartrap-Nemadji (04010301)+, Bad-Montreal (04010302)+, Black-Presque Isle (04020101)+, Ontonagon (04020102)+, Keweenaw Peninsula (04020103)+, Sturgeon (04020104)+, Dead-Kelsey (04020105)+, Betsy-Chocolay (04020201)+, Duck-Pensaukee (04030103)+, Oconto (04030104)+, Peshtigo (04030105)+, Brule (04030106)+, Menominee (04030108)+, Cedar-Ford (04030109)+, Escanaba (04030110)+, Fishdam-Sturgeon (04030112)+, Upper Fox (04030201)+*, Wolf (04030202)+, Lake Winnebago (04030203)+*, Lower Fox (04030204)+, Kalamazoo (04050003)+*, Upper Grand (04050004)+*, Lower Grand (04050006)+, Pere Marquette-White (04060101)+, Muskegon (04060102)+, Manistee (04060103)+, Betsie-Platte (04060104)+, Boardman-Charlevoix (04060105)+, Manistique (04060106)+, Lone Lake-Ocqueoc (04070003)+, Cheboygan (04070004)+, Black (04070005)+, Thunder Bay (04070006)+, Au Sable (04070007)+, Au Gres-Rifle (04080101)+, Tittabawassee (04080201)+, Pine (04080202)+, Shiawassee (04080203)+*, Huron (04090005)+*, Black-Rocky (04110001)+*, Otter Creek (04150402)+, Winooski River (04150403)+, Lake Champlain (04150408)+
05	Conewango (05010002)+, Middle Allegheny-Tionesta (05010003)+, French (05010004)+, Middle Allegheny-Redbank (05010006)+, Conemaugh (05010007)+, Lower Allegheny (05010009)+
07	Rum (07010207)+, Upper St. Croix (07030001)+, Namekagon (07030002)+, Kettle (07030003)+, Lower St. Croix (07030005)+, Rush-Vermillion (07040001)+, Cannon (07040002)+, Buffalo-Whitewater (07040003)+, Zumbro (07040004)+, Trempealeau (07040005)+, La Crosse-Pine (07040006)+, Black (07040007)+, Root (07040008)+, Upper Chippewa (07050001)+, Flambeau (07050002)+, South Fork Flambeau (07050003)+, Jump (07050004)+, Lower Chippewa (07050005)+, Eau Claire (07050006)+, Red Cedar (07050007)+, Coon-Yellow (07060001)+, Grant-Little Maquoketa (07060003)+*, Turkey (07060004)+, Maquoketa (07060006)+, Upper Wisconsin (07070001)+, Lake Dubay (07070002)+, Castle Rock (07070003)+, Baraboo (07070004)+, Lower Wisconsin (07070005)+, Kickapoo (07070006)+, Upper Cedar (07080201)+, Shell Rock (07080202)+, Winnebago (07080203)+, West Fork Cedar (07080204)+, Middle Cedar (07080205)+, Middle Iowa (07080208)+, Lower Iowa (07080209)+

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: a medium-sized aquatic turtle
General Description: A medium-sized turtle with a low, broad, gray to brown, usually keeled carapace that is intricately sculptured with concentric growth layers; plastron is yellow, each scute having an irregular dark lateral blotch; adults have orange on neck and limbs and usually are 14-20 cm in carapace length, rarely to 23 cm (Smith and Brodie 1982, Conant and Collins 1991). Hatchlings average 26.6-34 mm carapace length (CL) (Harding and Bloomer 1979, Lovich et al. 1990) and have a tail that may be as long as the carapace.
Diagnostic Characteristics: Differs from box turtles and Blanding's turtle in lacking a hinged plastron. Differs from diamondback terrapin in habitat and having orange neck and leg skin in adults and a plain colored (vs. patterned) head in young.
Reproduction Comments: Copulates in spring or fall (e.g., Niederberger and Seidel 1999, Ernst 2001); mostly in spring in the north; usually late March-April and October-November in New Jersey (Farrell and Graham 1991); more often in fall than in spring in Virginia and central Pennsylvania (Kaufmann 1992).

Depending on local climate, eggs can be laid anytime from mid-May to early July. In New Jersey, Virginia, and Pennsylvania (Ernst 2001), a single clutch generally is laid in June. Clutch size usually is 4-18 (often 7-14). Clutch size averaged 11 in Wisconsin (Ross et al. 1991), about 9 in Ontario (Brooks et al. 1992).

In New Jersey, clutch size was 5-11 (mean 8.5) (Farrell and Graham, 1991). Harding and Bloomer reported that clutches averaged 10 eggs in Michigan, and clutches of 13-14 eggs were "not uncommon." Eggs hatch after 70-80 days, August-October (after about 70 days, generally in late August, in New Jersey). Sex is genetically determined, and sex ratios are approximately 1:1 at birth (Ewert and Nelson 1991).

In New Jersey, wood turtles grow to 165 mm (6.5 inches) in 7 or 8 years. In Michigan, growth rates are slower, and it may take as many as 12 years to attain a 169 mm CL (Harding, 1990). Growth rates for males and females are constant until secondary sexual differences begin to appear, when males begin to grow faster, and ultimately become larger than females (Lovich et al. 1990). Harding (1990) found that average CL of females was 182 mm (n = 105), and average CL of males was 200 mm (n = 86). After and early growth spurt, growth of both sexes slows considerably, until by 20 years of age, growth rates are so slow that annual growth rings on the shell no longer yield accurate age data (Harding 1990).

In Pennsylvania, secondary sexual characteristics began to appear at 5-9 years of age, at a size of 160 to 180 mm (Lovich et al. 1990). However, there is usually a delay of several years between sexual differentiation and sexual maturity. Maturity is apparently not attained until 12 to 15 years of age (Lovich et al. 1990, Farrell and Graham 1991, Harding 1990). In a long term study in Michigan, Harding reported that the smallest female found laying eggs was 158 mm carapace length and had twelve growth rings, indicating she was at least 12 years old. In New Jersey, attained maturity in 14th year (Farrell and Graham 1991). In Wisconsin, the youngest gravid female was 14 years old; the smallest male observed copulating was 20 years old (Ross et al. 1991). In Ontario age at maturity was 17-18 years (Brooks et al. 1992).

Nesting success generally is very low, with egg predators taking a heavy toll. One report conservatively estimated egg and hatchling mortality at 98% (Harding 1990). An Ontario population incurred a high rate of predation on nests and adults (Brooks et al. 1992). Reproductive success depends on a high rate of adult survival, long-lived adults that reproduce many times during their lifetime, and the occasional good season when a nest survives (Harding, pers. comm. 1992).

Adults may live for many years, with maximum ages of 32 years (wild caught) and 58 years (captive) reported by Harding and Bloomer (1979). In Pennsylvania, several known-age turtles marked as juveniles were found to live at least 30 to 42 years (Ernst, 1992, personal communication). Given the difficulty of aging turtles over 20 years, the wild caught age is likely conservative.
Ecology Comments: Solitary late spring-summer; may aggregate in or near hibernation sites. Not territorial (Kaufmann 1992, which see for a detailed study of social behavior in central Pennsylvania).

New Jersey populations averaged 12.5 adults/ha, but the turtles were usually concentrated around basking areas or favorite food patches, rather than spread evenly across an area. In New Jersey, population density over several years averaged 10.7/ha of suitable habitat (Farrell and Graham 1991). In Michigan, the populations seem to be more scattered, and density is likely considerably lower. In southern Quebec, density was estimated at 1.2 turtles per 100 m of river (Daigle 1997). In West Virginia, estimated density was 19.1 individuals per hectare of total habitat (287-337 individuals along a 1.7 km length of river) (Niederberger and Seidel 1999). In Pennsylvania, density for 240 ha of available habitat was 0.66 turtles/ha, whereas density for available riparian habitat where most turtles occurred was 4.42 turtles/ha (Ernst 2001).

The combination of late maturity, low reproductive success, and long-lived adults results in a population structure skewed heavily toward adults. Harding's study populations consisted of 80 to 85% adults. Farrell and Graham (1991) reported 3% juveniles (1 to 8 years), 53% subadults (9 to 13 years), and 34% adults (over 13 years) in one New Jersey population; almost half of the population comprised individuals over 14 cm in plastron length These characteristics combine to delay the detection of population declines, and to reduce the ability of small, declining populations to recover. A population studied in West Virginia included 46% juveniles (Niederberger and Seidel 1999).
Non-Migrant: N
Locally Migrant: Y
Long Distance Migrant: N
Mobility and Migration Comments: In Virginia, a male moved 1 km in one day from his hibernaculum to his normal home

range (Ernst and McBreen 1991, Mitchell 1991). In New Hampshire, Tuttle (1996) recorded movements of over 900 m in one day.

After eggs are laid, adults in eastern populations often disperse to more upland areas for summer range, where they tend to remain within a fairly defined, though variably sized, area (referred to as "home range" below).

The home range is often elongate because of the tendency to follow streams (Strang 1983). Virtually all turtle locations are within 150-300 m of streams used by the turtles (Harding and Bloomer 1979, Arvisais et al. 2002). Based on the 95% convex polygon method, the largest home ranges have been documented in Quebec and Ontario (averaging about 24-28 ha; largest single-season home range = 132 ha) (Quinn and Tate 1991, Arvisais et al. 2002). Maps in Quinn and Tate (1991) depicted home ranges of up to about 1.9 km in longest dimension; one female moved 3.6 km in a fairly straight line from her apparent nesting site to her late summer range. Home range size documented by others is an order of magnitude smaller (average less than 7 ha) (Strang 1983, Kaufmann 1995, Ross et al. 1991, Tuttle 1996, Tuttle and Carroll 1997, Ernst 2001; see also Arvisais et al. 2002).

Wood turtles have a reputation of intelligence and agility. They are excellent climbers and easily escape from boxes and enclosures. They are quick to learn mazes, daily routines, and are known to be good at homing (Tinklepaugh 1932, Clement 1958). Caroll and Ehrenfeld (1978) reported that wood turtles could often return to the exact spot of capture when released up to 2 kilometers away. Homing ability fell off sharply beyond the 2 km distance, and learning, age, and sex were not found to influence homing ability.
Riverine Habitat(s): CREEK, Low gradient, MEDIUM RIVER, Moderate gradient
Palustrine Habitat(s): FORESTED WETLAND, HERBACEOUS WETLAND, Riparian
Terrestrial Habitat(s): Forest - Hardwood, Grassland/herbaceous, Sand/dune
Special Habitat Factors: Benthic, Burrowing in or using soil, Fallen log/debris
Habitat Comments: Wood turtles live along permanent streams during much of each year but in summer may roam widely overland and can be found in a variety of terrestrial habitats adjacent to streams, including deciduous woods, cultivated fields, and woodland bogs, marshy pastures. Use of woodland bogs and marshy fields is most common in the northern part of the range.

Wood turtles are often associated with the margins of woods. For example, in Wisconsin, wood turtles used wet mesic forest in riverbottom and riparian shrub/forest ecotones; most captures were in ecotones between alder thickets and grassy openings (Ross et al. 1991). In western Maine, within activity areas, wood turtles selected nonforested locations close to water with low canopy cover; within a watershed, they selected activity areas close to streams with moderate forest cover and little open water; overall they appeared to select forest edges to balance thermoregulatory and feeding needs (Compton et al. 2002).

Most activity is terrestrial June-August in Pennsylvania, May-October in New Jersey (Farrell and Graham 1991), but turtles commonly enter streams at night (Kaufmann 1992). Individuals occur mainly in streams in spring and fall. Some agricultural operations may be locally beneficial by providing a mixture of different food and cover types near wooded streams (Kaufmann 1992). Western populations are closely associated with water year-round, and eastern populations tend to be more terrestrial in the summer. According to Harding and Bloomer, Michigan wood turtles were never found more than 152 m (500 ft) from water, and had leeches (evidence of aquatic habits) at all times of the year. New Jersey wood turtles were found farther from water and were free of leeches during summer months. Hatchlings and small juveniles are much more closely associated with water than are adults. In Minnesota, Buech et al. (1990, 1991) found that nesting habitat and stream substrate are the most important habitat determinants. Wood turtles were never found in water where the bottom substrate was mucky. Harding (1990) reported that in Michigan these turtles are not found in clay-bottomed streams. However, Carl Ernst (1992, pers. comm.) reported that in Virginia and Pennsylvania the turtles can be found in streams with clay substrate. Harding (1990) also reported that wood turtles are usually found where openings in the streamside canopy allow growth of herbaceous plants. These openings provide both food and basking sites. As with other turtles, nesting wood turtles require loose substrate on fully exposed (unshaded) sites, such as sandy banks or sand-gravel bars in streams. When natural openings are unavailable they may use such man-made disturbances as road grades, railroad grades, sand pits, or plowed fields.

Overwintering occurs in bottoms or banks of streams where water flows all winter, including pools underneath a layer of ice; underwater muskrat burrows, beaver lodges, or over-bank root systems also may be used as winter hibernation (brumation) sites (Ernst 1986).

Reproductive activity (courtship, copulation) is aquatic (Ernst 1986). Eggs are laid in open sunny areas in fairly moist but well-drained, sandy or gravelly soil, commonly in clearings created by humans. Sites are usually near a stream, but females often appear along roads at this time of year, presumably looking for nesting sites in the soft shoulder material. This habit is a significant source of adult mortality. The female digs a hole in the dirt or sand with her hind feet, deposits the eggs and then carefully fills in the soil and tamps it flat (Pallas 1960).

Other turtles often share nest sites with this species. McBreen (1989) reported that Chelydra serpentia, Chrysemys picta, Terrapene carolina, Pseudemys rubrinventris used the same nest sites as wood turtles in Virginia. In Michigan wood turtles shared nesting areas with Chrysemys picta and Chelydra serpentina. In New Jersey, Clemmys muhlenbergi, C. guttata, Chrysemys picta, Chelydra serpentina, and Terrapene carolina commonly share nesting areas with wood turtles (Harding and Bloomer 1979).
Adult Food Habits: Carnivore, Frugivore, Invertivore, Piscivore
Immature Food Habits: Carnivore, Frugivore, Invertivore, Piscivore
Food Comments: Opportunistic omnivore. Pope (1967) indicated a strong preference for vegetable matter, including fruits, berries, tender leaves, and mushrooms. Harding and Bloomer (1979) listed insects, earthworms, mollusks, tadpoles, dead fish, and newborn mice as foods, with invertebrates and plant matter predominant. Favorite leaves include sandbar willow and strawberries (Harding 1990). Strang (1983) tallied food choices of wood turtles in their natural habitat in Pennsylvania and found that they ate fungi and green leaves most frequently (accounting for a total of 68% of all feeding observations), and fruits/flowers and insects about equally (totalling 32% of observations). In Pennsylvania, Ernst (2001) reported a diet of earthworms, leeches, caterpillars, fish (likely carrion), and Rana clamitans tadpoles and adults.

Feeds in water and on land (Ernst 2001). In some areas, reported to stamp the front feet or hit the plastron on the ground, which brings earthworms to the surface where they can be captured and eaten.
Adult Phenology: Diurnal, Hibernates/aestivates
Immature Phenology: Diurnal, Hibernates/aestivates
Phenology Comments: Most active diurnally, March or April through October or November (Farrell and Graham 1991, Ernst 2001). Some aquatic movements may occur in winter, especially in the southern part of the range. Activity peaks in morning in summer, in afternoon in spring and fall. Mating and egg layinh sometimes continue after dark. Does not estivate (Ernst 1986, Farrell and Graham 1991).

Males tend to be active and easy to find earlier in the spring than are females, whereas females are easier to find during the egg-laying season.
Length: 23 centimeters

Economic Attributes Expand

Management Summary Expand

Population/Occurrence Delineation Expand

Population/Occurrence Viability Expand

U.S. Invasive Species Impact Rank (I-Rank) Not yet assessed

Authors/Contributors Expand

References Expand

Use Guidelines & Citation Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Haliaeetus leucocephalus - (Linnaeus, 1766)
Bald Eagle
Taxonomic Status: Accepted
Related ITIS Name(s): *Haliaeetus leucocephalus* (Linnaeus, 1766) (TSN 175420)
French Common Names: pygargue à tête blanche
Spanish Common Names: Águila Cabeza Blanca
Unique Identifier: ELEMENT_GLOBAL.2.104470
Element Code: ABNKC10010
Informal Taxonomy: Animals, Vertebrates - Birds - Other Birds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Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Aves	Accipitriformes	Accipitridae	Haliaeetus

Genus Size: C - Small genus (6-20 species)

Check this box to expand all report sections: ☐

Concept Reference
Expand

Conservation Status
Collapse

NatureServe Status

Global Status: G5
Global Status Last Reviewed: 11Mar2005
Global Status Last Changed: 11Mar2005
Rounded Global Status: G5 - Secure
Reasons: Widespread distribution in North America; large numbers of occurrences, many of high quality, particularly in Alaska and British Columbia, but suffered great decline in southern and eastern part of range earlier this century; still susceptible to a number of threats, particularly environmental contaminants and excessive disturbance by humans; recent rangewide improvement in numbers and the protection offered by governments prevent it from being ranked any higher.
Nation: United States
National Status: N5B,N5N (05Jan1997)
Nation: Canada
National Status: N5B,N5N (09Feb2012)

U.S. & Canada State/Province Status	
	Alabama (S4B), Alaska (S5), Arizona (S2S3B,S4N), Arkansas (S2B,S4N), California (S2), Colorado (S1B,S3N), Connecticut (S1B,S3N), Delaware (S2B,S3N), District of Columbia (S2N,SXB), Florida (S3), Georgia (S2), Idaho (S3B,S4N), Illinois (S2B,S3N), Indiana (S2), Iowa (S3B,S3N), Kansas (S2B,S4N), Kentucky (S2B,S2S3N), Louisiana (S3), Maine (S4B,S4N), Maryland (S3B), Massachusetts (S2B,S3N), Michigan (S4), Minnesota (S3B,S3N),

United States	Mississippi (S2B,S2N), Missouri (S3), Montana (S3), Navajo Nation (S2S3N), Nebraska (S3), Nevada (S1B,S3N), New Hampshire (S2), New Jersey (S1B,S1N), New Mexico (S1B,S4N), New York (S2S3B,S2N), North Carolina (S3B,S3N), North Dakota (S1), Ohio (S2), Oklahoma (S1S3), Oregon (S4B,S4N), Pennsylvania (S2B), Rhode Island (S1B,S1N), South Carolina (S2), South Dakota (S1B,S2N), Tennessee (S3), Texas (S3B,S3N), Utah (S2B,S4N), Vermont (S1B,S4N), Virginia (S3S4B,S3S4N), Washington (S4B,S4N), West Virginia (S2B,S3N), Wisconsin (S4B,S4N), Wyoming (S3B,S5N)
Canada	Alberta (S4), British Columbia (S5B,S5N), Labrador (S4B), Manitoba (S4S5B), New Brunswick (S3B), Newfoundland Island (S4B), Northwest Territories (S4S5B), Nova Scotia (S4), Nunavut (SNRN), Ontario (S2N,S4B), Prince Edward Island (S4), Quebec (S3S4), Saskatchewan (S5B,S4M,S4N), Yukon Territory (S4B)

Other Statuses

U.S. Fish & Wildlife Service Lead Region: R3 - North Central
Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Not at Risk (01Apr1984)
IUCN Red List Category: LC - Least concern
Convention on International Trade in Endangered Species Protection Status (CITES): Appendix II

NatureServe Global Conservation Status Factors

Range Extent: >2,500,000 square km (greater than 1,000,000 square miles)
Range Extent Comments: Breeding range extends from central Alaska, northern Yukon, northwestern and southern Mackenzie, northern Saskatchewan, northern Manitoba, central Ontario, central Quebec, Labrador, and Newfoundland south locally to the Commander and Aleutian Islands, southern Alaska, Baja California (both coasts), Sonora (Brown et al. 1988), New Mexico, Arizona, Texas Gulf Coast, and Florida (including the Keys); breeding is very localized in the Great Basin and prairie and plains regions in interior North America, where the the breeding range recently has expanded to include Nebraska and Kansas. In Arizona, nesting occurs primarily along the Salt and Verde rivers in the central part of the state; only a few pairs nest in the western part of the state (http://www.swbemc.org/nest_sites.html). In Nevada, the few nesting pairs are primarily in the west-central part of the state, with another nesting area in extreme southern Elko County (GBBO 2010).

In the nonbreeding season, bald eagles occur generally throughout the breeding range except in the far north (AOU 1983, Sibley and Monroe 1990), most commonly from southern Alaska and southern Canada southward. The Chilkat Bald Eagle Preserve, Alaska, supports the largest wintering population anywhere (Ehrlich et al. 1992). Winter concentrations occur in British Columbia-northwestern Washington, along the Missouri and Mississippi rivers, and in northern Arkansas. One of the largest fall (mid-October to mid-December) migrant concentrations (200-300 birds at any one time, close to a thousand individuals through the season) occurs at Hauser Lake near Helena, Montana.

Number of Occurrences: > 300
Number of Occurrences Comments: The total number of occupied territories (not equivalent to breeding area occurrences) in British Columbia and Alaska is probably at least 7,000 (Gerrard 1983); there are about 1,000 on Vancouver Island alone (British Columbia CDC 1993). Kjos (1992) estimated there were 3,014 occupied bald eagle territories in the lower 48 states.

Population Size: 100,000 - 1,000,000 individuals
Population Size Comments: Gerrard (1983) estimated that Alaska and British Columbia had approximately 48,000 bald eagles. Blood and Anweiler (1991) gave North American estimates of 70,000, with 21,000 in British Columbia. Alaska population is about 30,000, and perhaps almost that many occur in western Canada. Estimated number of breeding pairs in Canada in the early 1990s was 15,000-20,000 (Kirk et al. 1995). The reported number of nesting territories in the lower 48 states in 1990 was 3,014 (Kjos 1990). Population estimates (number of occupied territories) based on the 1990 breeding season survey were as follows: northern states, 1,165; Chesapeake Bay, 235; Pacific states, 861; southeastern states, 722; southwestern states, 27; total, 3,010 (USFWS 1990). In 1992, there were 149 nesting pairs in New England. Rich et al. (2004) estimated the global population at 330,000.

The winter count for 1992-1993 was about 400 in Maine, 70 in Massachusetts, 61 in Connecticut, 23 in New Hampshire, 12 in Vermont, and a few in Rhode Island (End. Sp. Tech. Bull. 18(2):20). Winter count in late 1980s yielded about 11,250 bald eagles in the lower 48 states.

See Busch (1988) for information on status in the southwestern United States. About 100-150 bald eagles winter in Nevada; only a few pairs nest in the state (Nevada Department of Wildlife, GBBO 2010). See Brown et al. (1988) for status in Sonora, Mexico.

Overall Threat Impact: Medium
Overall Threat Impact Comments: Major threats include habitat loss, disturbance by humans, biocide contamination, decreasing food supply, and illegal shooting (Evans 1982, Green 1985, Herkert 1992). In 1992, many died in northern Utah after eating poisoned bait set out by ranchers. Breeding success still is being affected by environmental contaminants in the diet along Lake Superior in Wisconsin (Kozie and Anderson 1991). Bio-accumulated mercury from fish or exposure to other pesticides may interfere with reproduction or cause direct mortality (see GBBO 2010). Greatest potential threats in Florida include urban development and commercial timber harvest (Wood et al. 1989). The Chilkat Bald Eagle Preserve, Alaska, which supports the largest wintering population anywhere, was threatened by a proposed copper mine in the early 1990s (Ehrlich et al. 1992). See Witmer and O'Neil (1990) for information on estimating cumulative impacts of multiple hydroelectric development and logging activities in Washington. See Montopoli and Anderson (1991) for a model used to evaluate the cumulative effects of selected forms of human disturbance in the Greater Yellowstone ecosystem. As of the mid-1990s, the population in the southwestern United States continued to face threats and required intensive management to maintain current population levels (1994 End. Sp. Tech. Bull. 19(5):18).

Generally susceptible to human intrusion, but "show a high degree of adaptability and tolerance if the human activity is not directed toward them" (Beebe 1974). However, chronic disturbance results in disuse of areas by eagles (Fraser 1985).

In Arizona, mortality from shooting, entanglement in monofilament, and heat stress continue to affect population expansion (J. T. Driscoll, in Corman and Wise-Gervais 2005).

Short-term Trend: Relatively stable to increase of 25%

Long-term Trend: Relatively stable to decline of 50%
Long-term Trend Comments: As of early 1990s, populations in many areas had rebounded from the low levels that occurred before DDT use was banned in the U.S. The population increase in recent years has been accomplished through protection and active management, as well as through enhanced reproduction after the DDT ban. Populations have been increasing in the contiguous 48 states: the number of nesting territories nearly tripled between 1980 and 1990 (Kjos 1992). In the lower 48 states, breeding population has doubled every 6-7 years since the late 1970s (USFWS, Federal Register, 12 July 1994, p. 35585). In Alaska and British Columbia numbers have been generally stable at about 48,000 (Gerrard 1983, Campbell et al. 1990). Populations are stable and "healthy" in Alaska and western Canada. As of the early 1980s, most Canadian populations were reasonably stable, and problem populations in southwestern Ontario and the maritime provinces were showing signs of recovery (Brownell and Oldham, 1984 COSEWIC report). Overall, populations have increased in Canada in recent decades (Kirk et al. 1995, Hunter and Baird 1995). A significant increase was recorded in migration counts in northeastern North America, 1972-1987 (Titus and Fuller 1990). The breeding population in the Chesapeake Bay region increased 12.6% per year from 1986 to 1990; the mean minimum survival rate of all eagles was 91%; however, eagle habitat there is being converted to human development at a rapid rate (Buehler et al. 1991). In California in the late 1980s, the winter population was stable, and the breeding population was increasing in numbers and range (California DF&G 1990). Bald eagle numbers in Arizona are now higher than ever recorded (due to intensive management), but nesting habitat is decreasing in the most productive areas, and some areas where eagles began to nest in the 1990s later were abandoned (J. T. Driscoll, in Corman and Wise-Gervais 2005).

Other NatureServe Conservation Status Information

Inventory Needs: Needs annual or biannual inventory until recovery goals are reached in the U.S. Then inventory could be reduced to longer (5-10 year) intervals at most locations.

Protection Needs: Acquisition of breeding territories is always a priority and is necessary for further improvement. Acquisition of other types of protection of winter foraging habitats and winter roosts advisable.

Distribution

Collapse

Global Range: (>2,500,000 square km (greater than 1,000,000 square miles)) Breeding range extends from central Alaska, northern Yukon, northwestern and southern Mackenzie, northern Saskatchewan, northern Manitoba, central Ontario, central Quebec, Labrador, and Newfoundland south locally to the Commander and Aleutian Islands, southern Alaska, Baja California (both coasts), Sonora (Brown et al. 1988), New Mexico, Arizona, Texas Gulf Coast, and Florida (including the Keys); breeding is very localized in the Great Basin and prairie and plains regions in interior North America, where the the breeding range recently has expanded to include Nebraska and Kansas. In Arizona, nesting occurs primarily along the Salt and Verde rivers in the central part of the state; only a few pairs nest in the western part of the state (http://www.swbemc.org/nest_sites.html). In Nevada, the few nesting pairs are primarily in the west-central part of the state, with another nesting area in extreme southern Elko County (GBBO 2010).

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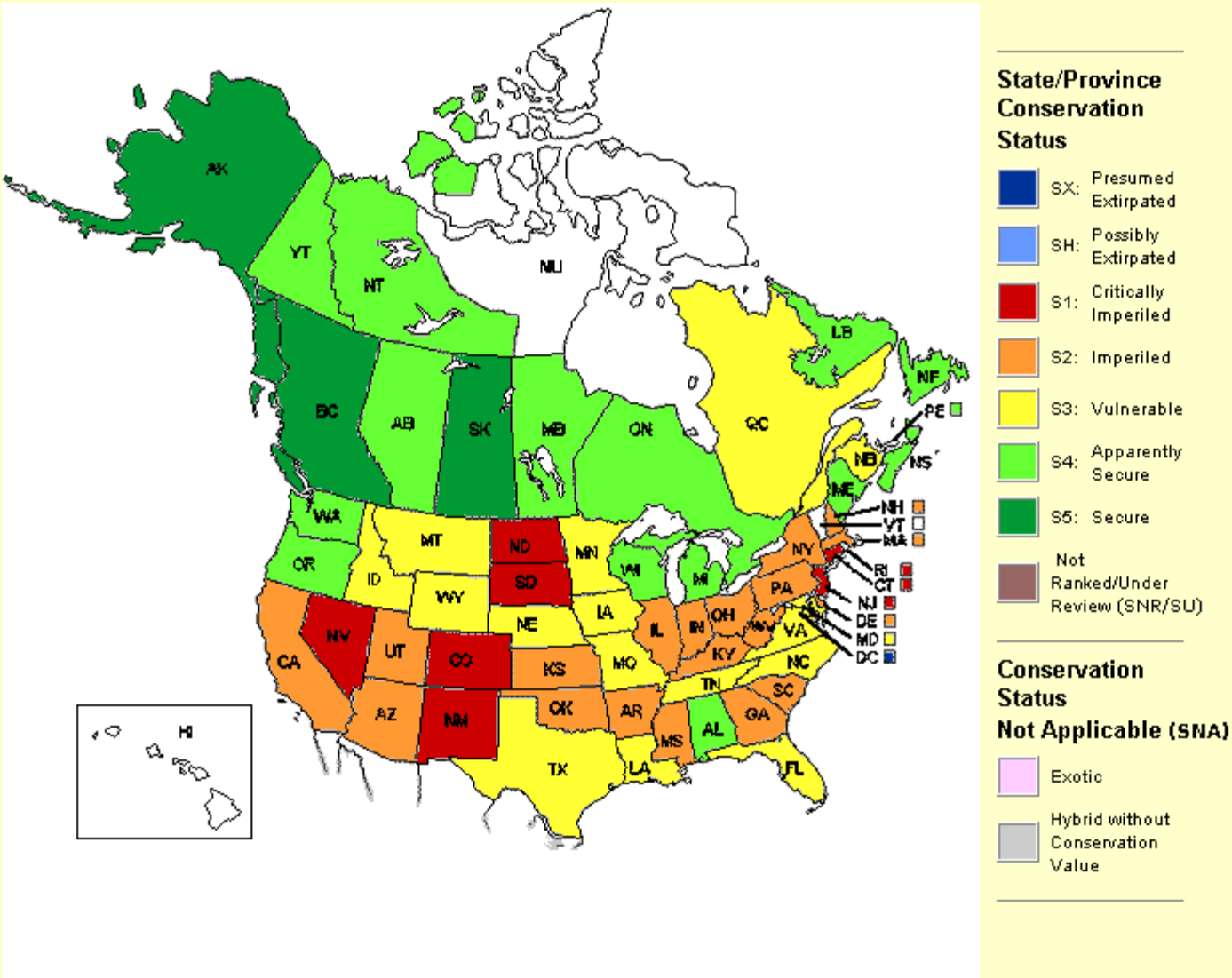
U.S. States and Canadian Provinces

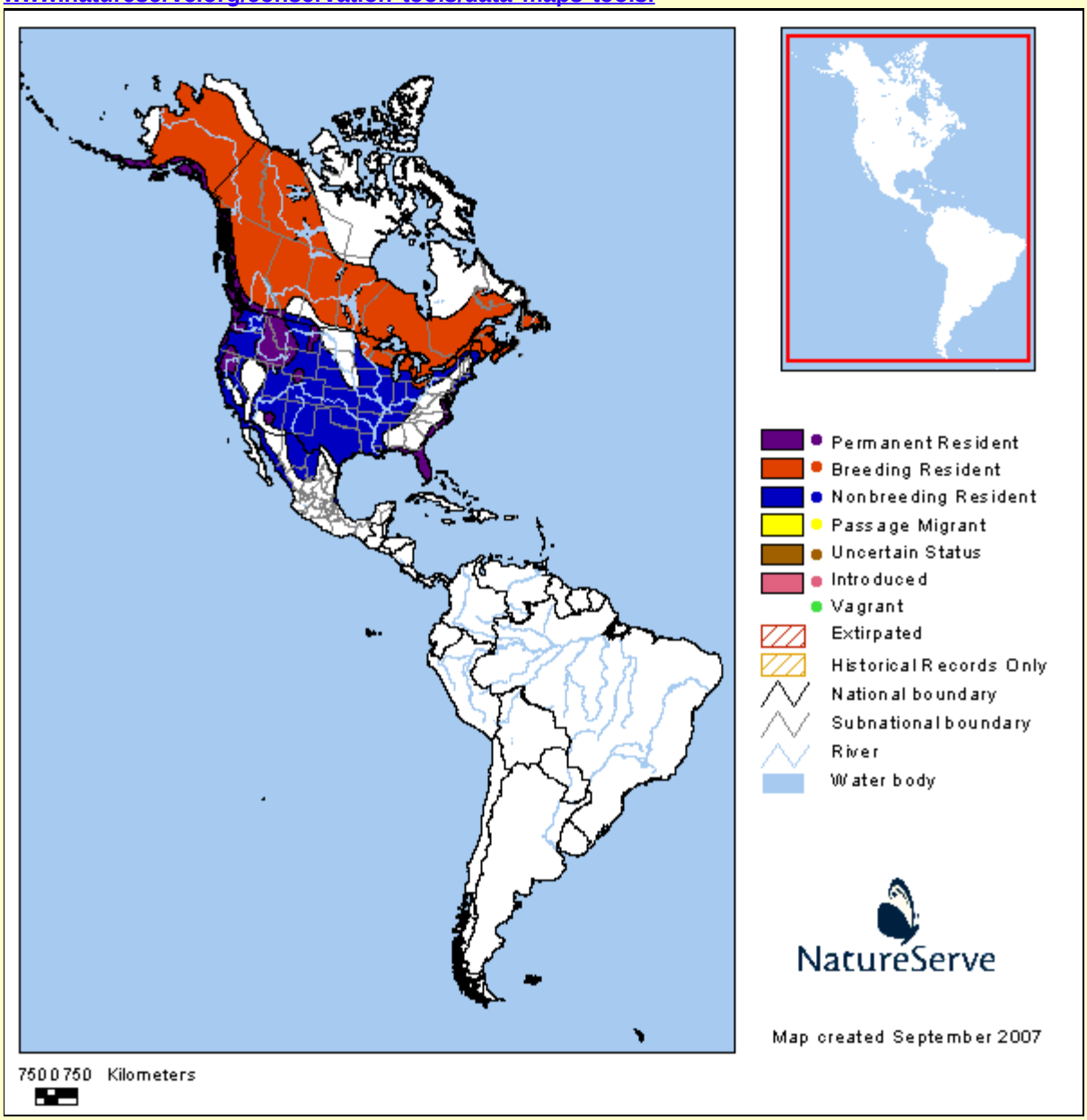


NOTE: The maps for birds represent the breeding status by state and province. In some jurisdictions, the subnational statuses for common species have not been assessed and the status is shown as not-assessed (SNR). In some jurisdictions, the subnational status refers to the status as a non-breeder; these errors will be corrected in future versions of these maps. A species is not shown in a jurisdiction if it is not known to breed in the jurisdiction or if it occurs only accidentally or casually in the jurisdiction. Thus, the species may occur in a jurisdiction as a seasonal non-breeding resident or as a migratory transient but this will not be indicated on these maps. See other maps on this web site that depict the Western Hemisphere ranges of

these species at all seasons of the year.
Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	AK, AL, AR, AZ, CA, CO, CT, DC, DE, FL, GA, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, MT, NC, ND, NE, NH, NJ, NM, NN, NV, NY, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, VA, VT, WA, WI, WV, WY
Canada	AB, BC, LB, MB, NB, NF, NS, NT, NU, ON, PE, QC, SK, YT

Range Map
Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: NatureServe, 2002; WILDSPACETM 2002

U.S. Distribution by County	
State	County Name (FIPS Code)

AL	Autauga (01001), Baldwin (01003), Barbour (01005), Cherokee (01019), Chilton (01021), Choctaw (01023), Clarke (01025), Colbert (01033)*, Coosa (01037), Dallas (01047), Elmore (01051), Escambia (01053), Franklin (01059)*, Greene (01063), Hale (01065), Henry (01067), Houston (01069), Jackson (01071), Lauderdale (01077)*, Lawrence (01079), Limestone (01083)*, Lowndes (01085), Madison (01089), Marengo (01091), Marshall (01095), Montgomery (01101), Perry (01105), Pickens (01107), Russell (01113), Sumter (01119), Tallapoosa (01123), Tuscaloosa (01125), Wilcox (01131)
AR	Arkansas (05001), Ashley (05003), Baxter (05005), Benton (05007), Cleburne (05023), Crawford (05033), Crittenden (05035), Cross (05037), Desha (05041), Drew (05043), Faulkner (05045), Franklin (05047), Fulton (05049), Garland (05051), Grant (05053), Greene (05055), Hempstead (05057)*, Jackson (05067), Jefferson (05069), Lafayette (05073), Lincoln (05079), Little River (05081), Logan (05083), Madison (05087), Marion (05089), Mississippi (05093), Monroe (05095), Phillips (05107), Pike (05109), Poinsett (05111), Prairie (05117), Pulaski (05119), Scott (05127), Sebastian (05131), Van Buren (05141)
AZ	Apache (04001), Coconino (04005), Gila (04007), Graham (04009), La Paz (04012), Maricopa (04013), Mohave (04015), Navajo (04017), Pinal (04021), Yavapai (04025)
CA	Alameda (06001), Alpine (06003), Butte (06007), Calaveras (06009), Colusa (06011), Contra Costa (06013), Del Norte (06015)*, El Dorado (06017), Fresno (06019), Glenn (06021), Humboldt (06023), Imperial (06025), Inyo (06027), Kern (06029), Lake (06033), Lassen (06035), Los Angeles (06037), Madera (06039), Mendocino (06045), Merced (06047), Modoc (06049), Mono (06051), Monterey (06053), Napa (06055), Nevada (06057), Orange (06059), Placer (06061), Plumas (06063), Riverside (06065), San Benito (06069), San Bernardino (06071), San Luis Obispo (06079), Santa Barbara (06083), Shasta (06089), Sierra (06091), Siskiyou (06093), Stanislaus (06099), Tehama (06103), Trinity (06105), Tuolumne (06109), Yuba (06115)
CO	Adams (08001), Alamosa (08003)*, Arapahoe (08005), Archuleta (08007), Baca (08009), Bent (08011), Boulder (08013), Conejos (08021), Crowley (08025), Douglas (08035)*, Eagle (08037), El Paso (08041), Fremont (08043), Garfield (08045), Grand (08049), Gunnison (08051)*, Jackson (08057), Jefferson (08059), Kiowa (08061), La Plata (08067), Larimer (08069), Las Animas (08071), Logan (08075)*, Mesa (08077), Mineral (08079), Moffat (08081), Montezuma (08083), Montrose (08085), Morgan (08087)*, Otero (08089), Park (08093), Pitkin (08097), Prowers (08099), Pueblo (08101), Rio Blanco (08103), Rio Grande (08105)*, Routt (08107), Saguache (08109), Sedgwick (08115)*, Washington (08121)*, Weld (08123), Yuma (08125)
CT	Fairfield (09001), Hartford (09003), Litchfield (09005), Middlesex (09007), New Haven (09009), New London (09011), Tolland (09013)
DE	Kent (10001), New Castle (10003), Sussex (10005)
FL	Alachua (12001), Bay (12005), Bradford (12007), Brevard (12009), Broward (12011)*, Charlotte (12015), Citrus (12017), Clay (12019), Collier (12021), Columbia (12023), DeSoto (12027), Dixie (12029), Duval (12031), Flagler (12035), Franklin (12037), Gadsden (12039), Gilchrist (12041), Glades (12043), Gulf (12045), Hamilton (12047), Hardee (12049), Hendry (12051), Hernando (12053), Highlands (12055), Hillsborough (12057), Indian River (12061), Jackson (12063), Jefferson (12065), Lake (12069), Lee (12071), Leon (12073), Levy (12075), Liberty (12077), Manatee (12081), Marion (12083), Martin (12085), Miami-Dade (12086), Monroe (12087), Okaloosa (12091), Okeechobee (12093), Orange (12095), Osceola (12097), Palm Beach (12099), Pasco (12101), Pinellas (12103), Polk (12105), Putnam (12107), Santa Rosa (12113), Sarasota (12115), Seminole (12117), St. Johns (12109), St. Lucie (12111), Sumter (12119), Suwannee (12121), Taylor (12123), Union (12125), Volusia (12127), Wakulla (12129), Walton (12131), Washington (12133)
GA	Appling (13001)*, Baker (13007), Baldwin (13009), Berrien (13019), Bibb (13021), Brooks (13027), Bryan (13029), Bulloch (13031), Butts (13035), Camden (13039), Chatham (13051), Chattahoochee (13053), Cherokee (13057), Clay (13061), Coffee (13069), Colquitt (13071), Columbia (13073)*, Cook (13075), Crisp (13081), Dade (13083)*, Decatur (13087), Dodge (13091), Dougherty (13095), Early (13099), Fannin (13111), Glynn (13127), Greene (13133), Hancock (13141), Harris (13145), Hart (13147), Heard (13149), Henry (13151), Jefferson (13163), Lanier (13173)*, Lee (13177), Liberty (13179), Lincoln (13181), Long (13183), Lowndes (13185), Macon (13193), Mcduffie (13189), Mcintosh (13191), Meriwether (13199)*, Mitchell (13205), Monroe (13207), Morgan (13211), Murray (13213), Putnam (13237), Quitman (13239), Richmond (13245), Rockdale (13247)*, Seminole (13253), Sumter (13261), Talbot (13263), Thomas (13275), Troup (13285), Twiggs (13289), Union (13291), Walton (13297), Wilkes (13317), Wilkinson (13319), Worth (13321)
IA	Adair (19001), Allamakee (19005), Appanoose (19007), Audubon (19009), Benton (19011), Black Hawk (19013), Boone (19015), Bremer (19017), Buchanan (19019), Buena Vista (19021), Butler (19023), Calhoun (19025), Carroll (19027), Cass (19029), Cedar (19031), Cerro Gordo (19033), Cherokee (19035),

	Chickasaw (19037), Clay (19041), Clayton (19043), Clinton (19045), Dallas (19049), Davis (19051), Decatur (19053), Delaware (19055), Des Moines (19057), Dickinson (19059), Dubuque (19061), Fayette (19065), Floyd (19067), Franklin (19069), Fremont (19071), Guthrie (19077), Hamilton (19079), Hancock (19081), Hardin (19083), Harrison (19085), Henry (19087), Howard (19089), Humboldt (19091), Iowa (19095), Jackson (19097), Jasper (19099), Jefferson (19101), Johnson (19103), Jones (19105), Keokuk (19107), Kossuth (19109), Lee (19111), Linn (19113), Louisa (19115), Lucas (19117), Lyon (19119), Mahaska (19123), Marion (19125), Marshall (19127), Mills (19129), Mitchell (19131), Monona (19133), Montgomery (19137), Muscatine (19139), O Brien (19141), Page (19145), Palo Alto (19147), Plymouth (19149), Polk (19153), Pottawattamie (19155), Poweshiek (19157), Ringgold (19159), Sac (19161), Scott (19163), Sioux (19167), Story (19169), Tama (19171), Taylor (19173), Van Buren (19177), Wapello (19179), Warren (19181), Washington (19183), Wayne (19185), Winneshiek (19191), Woodbury (19193), Worth (19195)
ID	Ada (16001), Adams (16003), Bannock (16005), Bear Lake (16007), Benewah (16009), Bingham (16011), Blaine (16013), Boise (16015), Bonner (16017), Bonneville (16019), Boundary (16021), Canyon (16027), Caribou (16029), Cassia (16031), Clark (16033), Clearwater (16035), Custer (16037), Elmore (16039), Franklin (16041), Fremont (16043), Gem (16045), Gooding (16047), Idaho (16049), Jefferson (16051), Jerome (16053), Kootenai (16055), Lemhi (16059), Lewis (16061), Madison (16065), Nez Perce (16069), Owyhee (16073), Payette (16075), Power (16077), Shoshone (16079), Teton (16081), Valley (16085), Washington (16087)
IL	Adams (17001), Alexander (17003), Bond (17005), Boone (17007), Brown (17009), Bureau (17011), Calhoun (17013), Carroll (17015), Cass (17017), Champaign (17019), Clark (17023), Clay (17025), Clinton (17027), Cook (17031), Crawford (17033), Cumberland (17035), De Witt (17039), Fayette (17051), Franklin (17055), Fulton (17057), Gallatin (17059), Greene (17061), Hancock (17067), Hardin (17069)*, Henderson (17071), Henry (17073), Jackson (17077), Jasper (17079), Jefferson (17081), Jersey (17083), Jo Daviess (17085), Johnson (17087), Kane (17089), Kendall (17093), Knox (17095), La Salle (17099), Lake (17097), Lawrence (17101), Lee (17103), Livingston (17105), Macon (17115), Madison (17119), Marion (17121), Marshall (17123), Mason (17125), Massac (17127), Mclean (17113), Menard (17129), Mercer (17131), Monroe (17133), Montgomery (17135), Morgan (17137), Moultrie (17139), Ogle (17141), Peoria (17143), Perry (17145), Pike (17149), Pope (17151), Pulaski (17153), Putnam (17155), Randolph (17157), Richland (17159), Rock Island (17161), Saline (17165), Sangamon (17167), Schuyler (17169), Scott (17171), St. Clair (17163), Stephenson (17177), Tazewell (17179), Union (17181), Vermilion (17183), Wabash (17185), Washington (17189), Wayne (17191), White (17193), Whiteside (17195), Will (17197), Williamson (17199), Winnebago (17201), Woodford (17203)
IN	Adams (18001), Allen (18003), Bartholomew (18005), Brown (18013), Carroll (18015), Cass (18017), Clay (18021), Crawford (18025), Daviess (18027), Decatur (18031), Dubois (18037), Fountain (18045), Franklin (18047), Fulton (18049), Gibson (18051), Greene (18055), Hamilton (18057), Harrison (18061), Howard (18067), Huntington (18069), Jackson (18071), Jasper (18073), Jefferson (18077), Jennings (18079), Johnson (18081), Knox (18083), Kosciusko (18085), La Porte (18091), Lagrange (18087), Lake (18089), Lawrence (18093), Marion (18097), Martin (18101), Miami (18103), Monroe (18105), Montgomery (18107), Morgan (18109), Newton (18111), Orange (18117), Owen (18119), Parke (18121), Perry (18123), Pike (18125), Posey (18129), Pulaski (18131), Putnam (18133), Ripley (18137), Scott (18143), Shelby (18145), Spencer (18147), St. Joseph (18141), Starke (18149), Sullivan (18153), Switzerland (18155), Tippecanoe (18157), Union (18161), Vermillion (18165), Vigo (18167), Wabash (18169), Warren (18171), Warrick (18173), Washington (18175), White (18181)
KS	Barton (20009), Coffey (20031), Douglas (20045), Ellsworth (20053), Geary (20061), Greenwood (20073), Hodgeman (20083), Jackson (20085), Jefferson (20087), Johnson (20091), Leavenworth (20103), Marion (20115), Miami (20121), Neosho (20133), Norton (20137), Osage (20139), Osborne (20141), Pottawatomie (20149), Riley (20161), Sedgwick (20173), Seward (20175), Shawnee (20177), Stafford (20185), Trego (20195), Wabaunsee (20197), Wyandotte (20209)
KY	Allen (21003), Ballard (21007), Bath (21011), Boone (21015), Calloway (21035), Carlisle (21039), Daviess (21059), Franklin (21073), Fulton (21075), Grayson (21085), Hart (21099), Henderson (21101), Henry (21103), Hickman (21105), Hopkins (21107), Jefferson (21111), Larue (21123), Laurel (21125), Lawrence (21127), Lewis (21135), Livingston (21139), Lyon (21143), Marshall (21157), Mason (21161), Meade (21163), Muhlenberg (21177), Nelson (21179), Todd (21219), Trigg (21221), Trimble (21223), Union (21225), Whitley (21235)
LA	Ascension (22005), Assumption (22007), Avoyelles (22009), Beauregard (22011), Bossier (22015), Caddo (22017), Calcasieu (22019), Claiborne (22027), Concordia (22029), De Soto (22031)*, East Baton Rouge (22033), Franklin (22041), Iberia (22045), Iberville (22047), Jackson (22049), Jefferson (22051), La Salle (22059), Lafourche (22057), Livingston (22063), Morehouse (22067), Natchitoches (22069),

	Orleans (22071), Ouachita (22073), Plaquemines (22075), Pointe Coupee (22077), Rapides (22079), Richland (22083), Sabine (22085), St. Bernard (22087), St. Charles (22089), St. James (22093), St. John the Baptist (22095), St. Landry (22097), St. Martin (22099), St. Mary (22101), St. Tammany (22103), Tangipahoa (22105), Tensas (22107), Terrebonne (22109), Union (22111), Vermilion (22113), West Baton Rouge (22121), West Feliciana (22125)
MA	Barnstable (25001)*, Berkshire (25003), Bristol (25005), Essex (25009), Franklin (25011), Hampden (25013), Hampshire (25015), Middlesex (25017), Plymouth (25023), Worcester (25027)
MD	Anne Arundel (24003), Baltimore (city) (24510), Baltimore County (24005), Calvert (24009), Caroline (24011), Carroll (24013)*, Cecil (24015), Charles (24017), Dorchester (24019), Frederick (24021), Garrett (24023), Harford (24025), Howard (24027), Kent (24029), Montgomery (24031), Prince Georges (24033), Queen Annes (24035), Somerset (24039), St. Marys (24037), Talbot (24041), Washington (24043), Wicomico (24045), Worcester (24047)
ME	Androscoggin (23001), Aroostook (23003), Cumberland (23005), Hancock (23009), Kennebec (23011), Knox (23013), Lincoln (23015), Oxford (23017), Penobscot (23019), Piscataquis (23021), Sagadahoc (23023), Somerset (23025), Waldo (23027), Washington (23029)
MI	Alcona (26001), Alger (26003), Allegan (26005), Alpena (26007), Antrim (26009), Arenac (26011), Baraga (26013), Barry (26015), Bay (26017), Benzie (26019), Calhoun (26025), Charlevoix (26029), Cheboygan (26031), Chippewa (26033), Clare (26035), Crawford (26039), Delta (26041), Dickinson (26043), Emmet (26047), Gladwin (26051), Gogebic (26053), Grand Traverse (26055), Gratiot (26057), Houghton (26061), Huron (26063), Ionia (26067), Iosco (26069), Iron (26071), Kalamazoo (26077), Kalkaska (26079), Keweenaw (26083), Lake (26085), Lapeer (26087), Leelanau (26089), Luce (26095), Mackinac (26097), Manistee (26101), Marquette (26103), Mason (26105), Mecosta (26107), Menominee (26109), Midland (26111), Missaukee (26113), Monroe (26115), Montcalm (26117), Montmorency (26119), Muskegon (26121), Newaygo (26123), Oceana (26127), Ogemaw (26129), Ontonagon (26131), Osceola (26133), Oscoda (26135), Otsego (26137), Ottawa (26139), Presque Isle (26141), Roscommon (26143), Saginaw (26145), Schoolcraft (26153), St. Clair (26147), Tuscola (26157), Wayne (26163), Wexford (26165)
MN	Aitkin (27001), Anoka (27003), Becker (27005), Beltrami (27007), Benton (27009), Big Stone (27011), Blue Earth (27013), Brown (27015), Carlton (27017), Carver (27019), Cass (27021), Chippewa (27023), Chisago (27025), Clay (27027), Clearwater (27029), Cook (27031), Crow Wing (27035), Dakota (27037), Douglas (27041), Faribault (27043), Fillmore (27045), Freeborn (27047), Goodhue (27049), Grant (27051), Hennepin (27053), Houston (27055), Hubbard (27057), Isanti (27059), Itasca (27061), Jackson (27063), Kanabec (27065), Kandiyohi (27067), Kittson (27069), Koochiching (27071), Lac Qui Parle (27073), Lake (27075), Lake of the Woods (27077), Le Sueur (27079), Lyon (27083), Mahnomen (27087), Marshall (27089), Mcleod (27085), Meeker (27093), Mille Lacs (27095), Morrison (27097), Nicollet (27103), Norman (27107), Olmsted (27109), Otter Tail (27111), Pennington (27113), Pine (27115), Polk (27119), Pope (27121), Ramsey (27123), Red Lake (27125), Redwood (27127), Renville (27129), Rice (27131), Roseau (27135), Scott (27139), Sherburne (27141), Sibley (27143), St. Louis (27137), Stearns (27145), Steele (27147), Stevens (27149), Swift (27151), Todd (27153), Traverse (27155), Wabasha (27157), Wadena (27159), Waseca (27161), Washington (27163), Watonwan (27165), Wilkin (27167), Winona (27169), Wright (27171), Yellow Medicine (27173)
MO	Adair (29001), Andrew (29003), Atchison (29005), Audrain (29007), Barry (29009), Bates (29013), Benton (29015), Bollinger (29017), Boone (29019), Butler (29023), Callaway (29027), Camden (29029), Cape Girardeau (29031), Carroll (29033), Cass (29037), Cedar (29039), Chariton (29041), Christian (29043), Clark (29045), Clay (29047)*, Clinton (29049), Cole (29051), Cooper (29053), Crawford (29055), Dade (29057), Daviess (29061), DeKalb (29063), Dent (29065), Douglas (29067), Dunklin (29069), Franklin (29071), Gasconade (29073), Gentry (29075), Greene (29077), Grundy (29079), Henry (29083), Hickory (29085), Holt (29087), Howard (29089), Howell (29091), Iron (29093), Jackson (29095), Jasper (29097), Jefferson (29099), Laclede (29105), Lafayette (29107), Lewis (29111), Lincoln (29113), Linn (29115), Livingston (29117), Macon (29121), Madison (29123), Maries (29125), Marion (29127), McDonald (29119), Miller (29131), Mississippi (29133), Moniteau (29135), Monroe (29137), Morgan (29141), New Madrid (29143), Oregon (29149), Osage (29151), Ozark (29153), Pemiscot (29155), Perry (29157), Pettis (29159), Phelps (29161), Pike (29163), Platte (29165), Polk (29167), Pulaski (29169), Ralls (29173), Randolph (29175), Ray (29177), Ripley (29181), Saline (29195), Schuyler (29197), Scott (29201)*, Shannon (29203), Shelby (29205)*, St. Charles (29183), St. Clair (29185), St. Louis (29189), Ste. Genevieve (29186), Stoddard (29207), Stone (29209), Taney (29213), Texas (29215), Vernon (29217), Warren (29219), Wayne (29223), Webster (29225), Wright (29229)
MS	Adams (28001), Bolivar (28011), Clay (28025)*, George (28039), Greene (28041), Grenada (28043),

	Hancock (28045), Harrison (28047), Hinds (28049), Holmes (28051), Issaquena (28055), Itawamba (28057)*, Jackson (28059), Kemper (28069), Lafayette (28071), Lowndes (28087), Madison (28089), Monroe (28095), Noxubee (28103)*, Oktibbeha (28105)*, Panola (28107), Pearl River (28109), Rankin (28121), Sunflower (28133)*, Tate (28137), Tishomingo (28141), Tunica (28143), Warren (28149), Wilkinson (28157), Winston (28159)*, Yalobusha (28161), Yazoo (28163)
MT	Beaverhead (30001), Big Horn (30003), Blaine (30005), Broadwater (30007), Carbon (30009), Carter (30011), Cascade (30013), Chouteau (30015), Custer (30017), Dawson (30021), Deer Lodge (30023), Fallon (30025), Fergus (30027), Flathead (30029), Gallatin (30031), Glacier (30035), Granite (30039), Hill (30041), Jefferson (30043), Lake (30047), Lewis and Clark (30049), Lincoln (30053), Madison (30057), McCone (30055), Meagher (30059), Mineral (30061), Missoula (30063), Musselshell (30065), Park (30067), Phillips (30071), Pondera (30073), Powder River (30075), Powell (30077), Prairie (30079), Ravalli (30081), Richland (30083), Roosevelt (30085), Rosebud (30087), Sanders (30089), Silver Bow (30093), Stillwater (30095), Sweet Grass (30097), Teton (30099), Toole (30101), Treasure (30103), Valley (30105), Wheatland (30107), Wibaux (30109), Yellowstone (30111)
NC	Anson (37007), Beaufort (37013), Bertie (37015), Bladen (37017), Brunswick (37019), Burke (37023), Cabarrus (37025), Camden (37029)*, Carteret (37031), Catawba (37035), Chatham (37037), Cherokee (37039), Chowan (37041), Clay (37043), Columbus (37047), Craven (37049), Currituck (37053), Dare (37055), Davidson (37057), Durham (37063), Edgecombe (37065), Franklin (37069), Gaston (37071), Gates (37073), Graham (37075), Granville (37077), Guilford (37081), Halifax (37083), Harnett (37085)*, Haywood (37087), Hyde (37095), Johnston (37101), Jones (37103), Lee (37105)*, Lenoir (37107), Macon (37113), Martin (37117), Mecklenburg (37119), Montgomery (37123), Nash (37127), New Hanover (37129), Northampton (37131), Onslow (37133), Orange (37135), Pamlico (37137), Pasquotank (37139), Pender (37141), Perquimans (37143), Pitt (37147), Rowan (37159), Rutherford (37161), Stanly (37167), Surry (37171), Swain (37173), Tyrrell (37177), Union (37179), Vance (37181), Wake (37183), Warren (37185), Washington (37187), Wayne (37191)*, Yadkin (37197)
ND	Billings (38007), Bottineau (38009), Burleigh (38015), Dunn (38025)*, McKenzie (38053), McLean (38055), Mercer (38057), Morton (38059), Oliver (38065), Slope (38087)*
NE	Antelope (31003), Blaine (31009), Boone (31011), Boyd (31015), Brown (31017), Buffalo (31019), Burt (31021), Cass (31025), Cedar (31027), Cherry (31031), Clay (31035), Colfax (31037), Cuming (31039), Custer (31041), Dakota (31043), Dawson (31047), Dixon (31051), Dodge (31053), Douglas (31055), Frontier (31063), Gage (31067), Garden (31069), Garfield (31071), Grant (31075), Greeley (31077), Hall (31079), Harlan (31083), Hitchcock (31087), Holt (31089), Hooker (31091), Howard (31093), Johnson (31097), Keith (31101), Keya Paha (31103), Knox (31107), Lancaster (31109), Lincoln (31111), Logan (31113), Loup (31115), Madison (31119), McPherson (31117), Merrick (31121), Morrill (31123), Nance (31125), Nemaha (31127), Nuckolls (31129), Otoe (31131), Pawnee (31133), Phelps (31137), Pierce (31139), Platte (31141), Polk (31143), Richardson (31147), Rock (31149), Saline (31151), Sarpy (31153), Saunders (31155), Scotts Bluff (31157), Sheridan (31161), Sherman (31163), Stanton (31167), Valley (31175), Washington (31177), Webster (31181)
NH	Belknap (33001), Carroll (33003), Cheshire (33005), Coos (33007), Grafton (33009), Hillsborough (33011), Merrimack (33013), Rockingham (33015), Strafford (33017), Sullivan (33019)
NJ	Atlantic (34001), Bergen (34003), Burlington (34005), Camden (34007), Cape May (34009), Cumberland (34011), Gloucester (34015), Hunterdon (34019), Mercer (34021), Middlesex (34023), Monmouth (34025), Morris (34027), Ocean (34029), Passaic (34031), Salem (34033), Somerset (34035), Sussex (34037), Warren (34041)
NM	Bernalillo (35001), Catron (35003)*, Colfax (35007), Mckinley (35031), San Juan (35045), Sierra (35051)
NV	Douglas (32005), Elko (32007), Lyon (32019)
NY	Albany (36001), Allegany (36003), Broome (36007), Cattaraugus (36009), Cayuga (36011), Chautauqua (36013), Chemung (36015), Chenango (36017), Clinton (36019), Columbia (36021), Cortland (36023), Delaware (36025), Dutchess (36027), Erie (36029), Essex (36031), Franklin (36033), Fulton (36035), Genesee (36037), Greene (36039), Hamilton (36041), Jefferson (36045), Livingston (36051), Monroe (36055), Niagara (36063), Onondaga (36067), Ontario (36069), Orange (36071), Orleans (36073), Oswego (36075), Otsego (36077), Putnam (36079), Rensselaer (36083), Rockland (36087), Saratoga (36091), Schenectady (36093), Schoharie (36095), Seneca (36099), St. Lawrence (36089), Steuben (36101), Sullivan (36105), Tioga (36107), Tompkins (36109), Ulster (36111), Warren (36113)*, Washington (36115), Wayne (36117), Westchester (36119), Wyoming (36121), Yates (36123)
OH	Coshocton (39031), Delaware (39041), Erie (39043), Geauga (39055), Guernsey (39059),

	Harrison (39067), Henry (39069), Huron (39077), Knox (39083), Lorain (39093), Lucas (39095), Mahoning (39099), Marion (39101), Mercer (39107), Noble (39121), Ottawa (39123), Portage (39133), Ross (39141), Sandusky (39143), Seneca (39147), Summit (39153), Trumbull (39155), Wayne (39169), Wood (39173), Wyandot (39175)
OK	Adair (40001), Alfalfa (40003)*, Caddo (40015), Canadian (40017), Carter (40019), Cherokee (40021), Choctaw (40023), Cimarron (40025), Cleveland (40027), Cotton (40033), Custer (40039), Delaware (40041), Garvin (40049), Grady (40051), Grant (40053)*, Haskell (40061), Hughes (40063), Kay (40071), Kingfisher (40073), LeFlore (40079), Logan (40083), Love (40085), McClain (40087), McIntosh (40091), Muskogee (40101), Noble (40103), Oklahoma (40109), Osage (40113), Pittsburg (40121), Sequoyah (40135), Stephens (40137), Texas (40139)*, Tulsa (40143), Wagoner (40145), Washita (40149)
OR	Baker (41001), Benton (41003), Clackamas (41005), Clatsop (41007), Columbia (41009), Coos (41011), Crook (41013), Curry (41015), Deschutes (41017), Douglas (41019), Grant (41023), Harney (41025), Hood River (41027), Jackson (41029), Jefferson (41031), Josephine (41033), Klamath (41035), Lake (41037), Lane (41039), Lincoln (41041), Linn (41043), Malheur (41045), Marion (41047), Multnomah (41051), Polk (41053), Tillamook (41057), Umatilla (41059), Union (41061), Wallowa (41063), Wasco (41065), Washington (41067), Wheeler (41069), Yamhill (41071)
PA	Adams (42001), Armstrong (42005), Beaver (42007), Bedford (42009), Berks (42011), Bradford (42015), Bucks (42017), Butler (42019), Cameron (42023), Carbon (42025), Centre (42027), Chester (42029), Clarion (42031), Clearfield (42033), Clinton (42035), Columbia (42037), Crawford (42039), Cumberland (42041), Dauphin (42043), Delaware (42045), Elk (42047), Erie (42049), Fayette (42051), Forest (42053), Fulton (42057), Huntingdon (42061), Jefferson (42065), Juniata (42067), Lancaster (42071), Lawrence (42073), Luzerne (42079), Lycoming (42081), McKean (42083), Mercer (42085), Mifflin (42087), Monroe (42089), Montgomery (42091), Montour (42093), Northampton (42095), Northumberland (42097), Perry (42099), Philadelphia (42101), Pike (42103), Sullivan (42113), Tioga (42117), Venango (42121), Warren (42123), Wayne (42127), Westmoreland (42129), Wyoming (42131), York (42133)
RI	Providence (44007)
SC	Abbeville (45001), Aiken (45003), Allendale (45005), Anderson (45007), Barnwell (45011), Beaufort (45013), Berkeley (45015), Calhoun (45017), Charleston (45019), Chester (45023), Clarendon (45027), Colleton (45029), Dillon (45033), Dorchester (45035), Edgefield (45037), Fairfield (45039), Florence (45041), Georgetown (45043), Greenwood (45047), Hampton (45049), Horry (45051), Jasper (45053), Kershaw (45055), Lancaster (45057), Lexington (45063), Marion (45067), Marlboro (45069), McCormick (45065), Newberry (45071), Orangeburg (45075), Richland (45079), Saluda (45081), Sumter (45085), York (45091)
SD	Aurora (46003), Beadle (46005), Bennett (46007), Bon Homme (46009), Brookings (46011), Brown (46013), Brule (46015), Buffalo (46017), Butte (46019), Campbell (46021), Charles Mix (46023), Clay (46027), Corson (46031), Custer (46033), Day (46037), Dewey (46041), Douglas (46043), Fall River (46047), Faulk (46049), Grant (46051), Gregory (46053), Hanson (46061), Harding (46063), Hughes (46065), Hutchinson (46067), Jones (46075), Kingsbury (46077), Lawrence (46081), Lincoln (46083), Lyman (46085), Marshall (46091), Meade (46093), Mellette (46095), Minnehaha (46099), Moody (46101), Pennington (46103), Perkins (46105), Roberts (46109), Sanborn (46111), Spink (46115), Stanley (46117), Sully (46119), Union (46127), Walworth (46129), Yankton (46135), Ziebach (46137)
TN	Benton (47005), Blount (47009), Carter (47019)*, Cheatham (47021)*, Clay (47027), Cocke (47029), Coffee (47031), Davidson (47037), DeKalb (47041), Decatur (47039), Dickson (47043), Franklin (47051), Gibson (47053)*, Grainger (47057), Hamblen (47063), Hamilton (47065), Hancock (47067), Hardin (47071), Hawkins (47073), Henry (47079), Houston (47083), Humphreys (47085), Jackson (47087), Jefferson (47089), Knox (47093), Lake (47095), Lauderdale (47097), Loudon (47105), Marion (47115), Meigs (47121), Monroe (47123), Obion (47131), Overton (47133), Perry (47135), Pickett (47137), Polk (47139), Rhea (47143), Roane (47145), Sevier (47155), Shelby (47157), Stewart (47161), Sullivan (47163), Sumner (47165), Union (47173)*, Washington (47179), Wilson (47189)
TX	Anderson (48001), Angelina (48005), Austin (48015), Bastrop (48021), Bell (48027), Bowie (48037), Brazoria (48039), Burnet (48053), Calhoun (48057), Cass (48067), Chambers (48071), Colorado (48089), Cooke (48097), Fannin (48147), Fayette (48149), Fort Bend (48157), Freestone (48161), Goliad (48175), Grayson (48181), Grimes (48185), Harris (48201), Henderson (48213), Hopkins (48223), Houston (48225), Jackson (48239), Kaufman (48257), Lavaca (48285), Leon (48289), Liberty (48291), Limestone (48293), Madison (48313), Matagorda (48321), Montgomery (48339), Nacogdoches (48347), Navarro (48349), Newton (48351), Panola (48365), Polk (48373), Refugio (48391), Robertson (48395), Rusk (48401),

	Sabine (48403), San Augustine (48405), San Jacinto (48407), San Saba (48411), Shelby (48419), Smith (48423), Trinity (48455), Tyler (48457), Victoria (48469), Walker (48471), Wharton (48481), Wood (48499)
UT	Beaver (49001), Box Elder (49003), Cache (49005), Carbon (49007), Daggett (49009), Davis (49011), Duchesne (49013), Emery (49015), Garfield (49017), Grand (49019), Iron (49021), Juab (49023), Millard (49027), Morgan (49029), Piute (49031), Rich (49033), Salt Lake (49035), San Juan (49037), Sanpete (49039), Sevier (49041), Summit (49043), Tooele (49045), Uintah (49047), Utah (49049), Wasatch (49051), Washington (49053), Wayne (49055), Weber (49057)
VA	Russell (51167)*, Washington (51191)*
VT	Addison (50001), Caledonia (50005), Chittenden (50007), Essex (50009), Grand Isle (50013), Orange (50017), Orleans (50019), Rutland (50021), Windham (50025), Windsor (50027)
WA	Asotin (53003)+*, Benton (53005)+*, Chelan (53007)+*, Clallam (53009)+*, Clark (53011)+*, Cowlitz (53015)+*, Douglas (53017)+*, Ferry (53019)+*, Franklin (53021)+*, Grant (53025)+*, Grays Harbor (53027)+*, Island (53029)+*, Jefferson (53031)+*, King (53033)+*, Kitsap (53035)+*, Kittitas (53037)+*, Klickitat (53039)+*, Lewis (53041)+*, Lincoln (53043)+*, Mason (53045)+*, Okanogan (53047)+*, Pacific (53049)+*, Pend Oreille (53051)+*, Pierce (53053)+*, San Juan (53055)+*, Skagit (53057)+*, Skamania (53059)+*, Snohomish (53061)+*, Spokane (53063)+*, Stevens (53065)+*, Thurston (53067)+*, Wahkiakum (53069)+*, Whatcom (53073)+*, Whitman (53075)+*, Yakima (53077)+*
WI	Adams (55001), Ashland (55003), Barron (55005), Bayfield (55007), Brown (55009), Buffalo (55011), Burnett (55013), Calumet (55015), Chippewa (55017), Clark (55019), Columbia (55021), Crawford (55023), Dane (55025), Dodge (55027), Door (55029), Douglas (55031), Dunn (55033), Eau Claire (55035), Florence (55037), Fond Du Lac (55039), Forest (55041), Grant (55043), Green (55045), Green Lake (55047), Iowa (55049), Iron (55051), Jackson (55053), Jefferson (55055), Juneau (55057), Kewaunee (55061), La Crosse (55063), Lafayette (55065), Langlade (55067), Lincoln (55069), Manitowoc (55071), Marathon (55073), Marinette (55075), Marquette (55077), Menominee (55078), Monroe (55081), Oconto (55083), Oneida (55085), Outagamie (55087), Ozaukee (55089), Pepin (55091), Pierce (55093), Polk (55095), Portage (55097), Price (55099), Richland (55103), Rock (55105), Rusk (55107), Sauk (55111), Sawyer (55113), Shawano (55115), Sheboygan (55117), St. Croix (55109), Taylor (55119), Trempealeau (55121), Vernon (55123), Vilas (55125), Washburn (55129), Washington (55131), Waukesha (55133), Waupaca (55135), Waushara (55137), Winnebago (55139), Wood (55141)
WV	Berkeley (54003), Grant (54023), Hampshire (54027), Hancock (54029), Hardy (54031), Jackson (54035), Jefferson (54037), Marion (54049), Mineral (54057), Monongalia (54061), Morgan (54065), Pendleton (54071), Pocahontas (54075), Putnam (54079), Raleigh (54081), Taylor (54091), Tucker (54093), Tyler (54095), Wood (54107)*
WY	Albany (56001), Big Horn (56003), Campbell (56005), Carbon (56007), Converse (56009)*, Crook (56011), Fremont (56013), Goshen (56015), Hot Springs (56017)*, Johnson (56019), Laramie (56021), Lincoln (56023), Natrona (56025), Park (56029), Platte (56031)*, Sheridan (56033), Sublette (56035), Sweetwater (56037), Teton (56039), Uinta (56041), Washakie (56043)*, Weston (56045)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed

Watershed Region	Watershed Name (Watershed Code)
01	Allagash (01010002)+, Fish (01010003)+, Aroostook (01010004)+, West Branch Penobscot (01020001)+, East Branch Penobscot (01020002)+, Mattawamkeag (01020003)+, Piscataquis (01020004)+, Lower Penobscot (01020005)+, Upper Kennebec (01030001)+, Dead (01030002)+, Lower Kennebec (01030003)+, Upper Androscoggin (01040001)+, Lower Androscoggin (01040002)+, St. Croix (01050001)+, Maine Coastal (01050002)+, St. George-Sheepscot (01050003)+, Passamaquoddy Bay-Bay of Fundy (01050004)+, Presumpscot (01060001)+, Saco (01060002)+, Piscataqua-Salmon Falls (01060003)+, Merrimack (01070002)+, Nashua (01070004)+, Merrimack (01070006)+, Upper Connecticut (01080101)+, Waits (01080103)+, Upper Connecticut-Mascoma (01080104)+, Black-Ottauquechee (01080106)+, Middle Connecticut (01080201)+, Deerfield (01080203)+, Chicopee (01080204)+, Lower Connecticut (01080205)+, Westfield (01080206)+, Farmington (01080207)+, Cape Cod (01090002)+, Narragansett (01090004)+,

	Quinebaug (01100001)+, Thames (01100003)+, Quinnipiac (01100004)+, Housatonic (01100005)+, Saugatuck (01100006)+
02	Upper Hudson (02020001)+, Sacandaga (02020002)+, Hudson-Hoosic (02020003)+, Mohawk (02020004)+, Schoharie (02020005)+, Middle Hudson (02020006)+, Rondout (02020007)+, Hudson-Wappinger (02020008)+, Lower Hudson (02030101)+, Hackensack-Passaic (02030103)+, Sandy Hook-Staten Island (02030104)+, Raritan (02030105)+, Upper Delaware (02040101)+, East Branch Delaware (02040102)+, Lackawaxen (02040103)+, Middle Delaware-Mongaup-Brodhead (02040104)+, Middle Delaware-Musconetcong (02040105)+, Lehigh (02040106)+, Crosswicks-Neshaminy (02040201)+, Lower Delaware (02040202)+, Schuylkill (02040203)+, Delaware Bay (02040204)+, Brandywine-Christina (02040205)+, Cohansey-Maurice (02040206)+, Broadkill-Smyrna (02040207)+, Mullica-Toms (02040301)+, Great Egg Harbor (02040302)+, Chincoteague (02040303)+, Upper Susquehanna (02050101)+, Chenango (02050102)+, Owego-Wappasening (02050103)+, Tioga (02050104)+, Chemung (02050105)+, Upper Susquehanna-Tunkhannock (02050106)+, Upper Susquehanna-Lackawanna (02050107)+, Upper West Branch Susquehanna (02050201)+, Sinnemahoning (02050202)+, Middle West Branch Susquehanna (02050203)+*, Bald Eagle (02050204)+, Pine (02050205)+, Lower West Branch Susquehanna (02050206)+, Lower Susquehanna-Penns (02050301)+, Raystown (02050303)+, Lower Juniata (02050304)+, Lower Susquehanna-Swatara (02050305)+, Lower Susquehanna (02050306)+, Upper Chesapeake Bay (02060001)+, Chester-Sassafras (02060002)+, Gunpowder-Patapsco (02060003)+, Severn (02060004)+, Choptank (02060005)+, Patuxent (02060006)+, South Branch Potomac (02070001)+, North Branch Potomac (02070002)+, Cacapon-Town (02070003)+, Conococheague-Opequon (02070004)+, Shenandoah (02070007)+, Middle Potomac-Catoctin (02070008)+, Middle Potomac-Anacostia-Occoquan (02070010)+, Lower Potomac (02070011)+, Western Lower Delmarva (02080109)+, Eastern Lower Delmarva (02080110)+, Pokomoke-Western Lower Delmarva (02080111)+
03	Middle Roanoke (03010102)+, Roanoke Rapids (03010106)+, Lower Roanoke (03010107)+, Ghowan (03010203)+, Meheriin (03010204)+, Albemarle (03010205)+, Upper Tar (03020101)+, Fishing (03020102)+, Lower Tar (03020103)+, Pamlico (03020104)+, Pamlico Sound (03020105)+, Upper Neuse (03020201)+, Middle Neuse (03020202)+, Contentnea (03020203)+, Lower Neuse (03020204)+, White Oak River (03020301)+, New River (03020302)+, Haw (03030002)+, Deep (03030003)+, Upper Cape Fear (03030004)+, Lower Cape Fear (03030005)+, Northeast Cape Fear (03030007)+*, Upper Yadkin (03040101)+, Lower Yadkin (03040103)+, Upper Pee Dee (03040104)+, Rocky, North Carolina, (03040105)+, Lower Pee Dee (03040201)+, Lynches (03040202)+, Little Pee Dee (03040204)+, Black (03040205)+, Waccamaw (03040206)+, Carolina Coastal-Sampit (03040207)+, Coastal Carolina (03040208)+, Upper Catawba (03050101)+, South Fork Catawba (03050102)+, Lower Catawba (03050103)+, Wateree (03050104)+, Upper Broad (03050105)+, Lower Broad (03050106)+, Saluda (03050109)+, Congaree (03050110)+, Lake Marion (03050111)+, Santee (03050112)+, Cooper (03050201)+, South Carolina Coastal (03050202)+, North Fork Edisto (03050203)+, Edisto (03050205)+, Four Hole Swamp (03050206)+, Salkehatchie (03050207)+, Broad-St. Helena (03050208)+, Bulls Bay (03050209)+, St. Helena Island (03050210)+, Seneca (03060101)+, Upper Savannah (03060103)+, Broad (03060104)+, Little (03060105)+, Middle Savannah (03060106)+, Brier (03060108)+, Lower Savannah (03060109)+, Calibogue Sound-Wright River (03060110)+, Upper Ogeechee (03060201)+, Lower Ogeechee (03060202)+, Canoochee (03060203)+, Ogeechee Coastal (03060204)+, Upper Oconee (03070101)+, Lower Oconee (03070102)+, Upper Ocmulgee (03070103)+, Little Ocmulgee (03070105)+, Altamaha (03070106)+, Satilla (03070201)+, Cumberland-St. Simons (03070203)+, Upper St. Johns (03080101)+, Oklawaha (03080102)+, Lower St. Johns (03080103)+, Daytona - St. Augustine (03080201)+, Cape Canaveral (03080202)+, Vero Beach (03080203)+, Kissimmee (03090101)+, Northern Okeechobee Inflow (03090102)+, Western Okeechobee Inflow (03090103)+, Lake Okeechobee (03090201)+, Everglades (03090202)+, Florida Bay-Florida Keys (03090203)+, Big Cypress Swamp (03090204)+, Caloosahatchee (03090205)+, Florida Southeast Coast (03090206)+, Peace (03100101)+, Myakka (03100102)+, Charlotte Harbor (03100103)+, Sarasota Bay (03100201)+, Manatee (03100202)+, Little Manatee (03100203)+, Alafia (03100204)+, Hillsborough (03100205)+, Tampa Bay (03100206)+, Crystal-Pithlachascotee (03100207)+, Withlacoochee (03100208)+, Waccasassa (03110101)+, Econfina-Steinhatchee (03110102)+, Aucilla (03110103)+, Upper Suwannee (03110201)+, Alapaha (03110202)+, withlacoochee (03110203)+, Little (03110204)+, Lower Suwannee (03110205)+, Santa Fe (03110206)+, Apalachee Bay-St. Marks (03120001)+, Upper Ochlockonee (03120002)+, Lower Ochlockonee (03120003)+, Middle Chattahoochee-Lake Harding (03130002)+, Middle Chattahoochee-Walter F. George Reservoir (03130003)+, Lower

	Chattahoochee (03130004)+, Upper Flint (03130005)+, Middle Flint (03130006)+, Kinchafoonee-Muckalee (03130007)+, Lower Flint (03130008)+, Spring (03130010)+, Apalachicola (03130011)+, Chipola (03130012)+, New (03130013)+, Apalachicola Bay (03130014)+, St. Andrew-St. Joseph Bays (03140101)+, Choctawhatchee Bay (03140102)+, Blackwater (03140104)+, Pensacola Bay (03140105)+, Lower Choctawhatchee (03140203)+, Lower Conecuh (03140304)+, Coosawattee (03150102)+, Etowah (03150104)+, Upper Coosa (03150105)+, Lower Coosa (03150107)+, Middle Tallapoosa (03150109)+, Lower Tallapoosa (03150110)+, Upper Alabama (03150201)+, Cahaba (03150202)+, Middle Alabama (03150203)+, Upper Tombigbee (03160101)+, Tibbee (03160104)+*, Luxapallila (03160105)+*, Middle Tombigbee-Lubbub (03160106)+, Sipsey (03160107)+, Noxubee (03160108)+, Lower Black Warrior (03160113)+, Middle Tombigbee-Chickasaw (03160201)+, Mobile - Tensaw (03160204)+, Lower Chickasawhay (03170003)+, Pascagoula (03170006)+, Escatawpa (03170008)+, Mississippi Coastal (03170009)+, Middle Pearl-Strong (03180002)+, Lower Pearl. Mississippi (03180004)+
04	Baptism-Brule (04010101)+, Beaver-Lester (04010102)+, St. Louis (04010201)+, Cloquet (04010202)+, Beartrap-Nemadji (04010301)+, Bad-Montreal (04010302)+, Black-Presque Isle (04020101)+, Ontonagon (04020102)+, Keweenaw Peninsula (04020103)+, Sturgeon (04020104)+, Dead-Kelsey (04020105)+, Betsy-Chocolay (04020201)+, Tahquamenon (04020202)+, Waiska (04020203)+, Lake Superior (04020300)+, Manitowoc-Sheboygan (04030101)+, Door-Kewaunee (04030102)+, Duck-Pensaukee (04030103)+, Oconto (04030104)+, Peshtigo (04030105)+, Brule (04030106)+, Michigamme (04030107)+, Menominee (04030108)+, Cedar-Ford (04030109)+, Escanaba (04030110)+, Tacoosh-Whitefish (04030111)+, Fishdam-Sturgeon (04030112)+, Upper Fox (04030201)+, Wolf (04030202)+, Lake Winnebago (04030203)+, Lower Fox (04030204)+, Milwaukee (04040003)+, St. Joseph (04050001)+, Black-Macatawa (04050002)+, Kalamazoo (04050003)+, Upper Grand (04050004)+, Maple (04050005)+, Lower Grand (04050006)+, Thornapple (04050007)+, Pere Marquette-White (04060101)+, Muskegon (04060102)+, Manistee (04060103)+, Betsie-Platte (04060104)+, Boardman-Charlevoix (04060105)+, Manistique (04060106)+, Brevoort-Millecoquins (04060107)+, St. Marys (04070001)+, Carp-Pine (04070002)+, Lone Lake-Ocqueoc (04070003)+, Cheboygan (04070004)+, Black (04070005)+, Thunder Bay (04070006)+, Au Sable (04070007)+, Au Gres-Rifle (04080101)+, Kawkawlin-Pine (04080102)+, Pigeon-Wiscoggin (04080103)+, Tittabawassee (04080201)+, Pine (04080202)+, Shiawassee (04080203)+, Flint (04080204)+, Cass (04080205)+, Saginaw (04080206)+, St. Clair (04090001)+, Huron (04090005)+, Ottawa-Stony (04100001)+, Raisin (04100002)+, St. Joseph (04100003)+, St. Marys (04100004)+, Lower Maumee (04100009)+, Cedar-Portage (04100010)+, Sandusky (04100011)+, Huron-Vermilion (04100012)+, Black-Rocky (04110001)+, Cuyahoga (04110002)+, Grand (04110004)+, Chautauqua-Conneaut (04120101)+, Cattaraugus (04120102)+, Niagara (04120104)+, Lake Erie (04120200)+*, Oak Orchard-Twelvemile (04130001)+, Upper Genesee (04130002)+, Lower Genesee (04130003)+, Irondequoit-Ninemile (04140101)+, Salmon-Sandy (04140102)+, Seneca (04140201)+, Oneida (04140202)+, Oswego (04140203)+, Chaumont-Perch (04150102)+, Upper St. Lawrence (04150301)+, Oswegatchie (04150302)+, Indian (04150303)+, Grass (04150304)+, Raquette (04150305)+, St. Regis (04150306)+, Chateaugay-English (04150308)+, Mettawee River (04150401)+, Otter Creek (04150402)+, Winooski River (04150403)+, Ausable River (04150404)+, Saranac River (04150406)+, Lake Champlain (04150408)+, St. Francois River (04150500)+
05	Upper Allegheny (05010001)+, Conewango (05010002)+, Middle Allegheny-Tionesta (05010003)+, French (05010004)+, Clarion (05010005)+, Middle Allegheny-Redbank (05010006)+, Conemaugh (05010007)+, Kiskiminetas (05010008)+, Tygart Valley (05020001)+, Upper Monongahela (05020003)+, Cheat (05020004)+, Upper Ohio (05030101)+, Shenango (05030102)+, Mahoning (05030103)+, Connoquenessing (05030105)+, Little Muskingum-Middle Island (05030201)+, Upper Ohio-Shade (05030202)+, Tuscarawas (05040001)+, Walhonding (05040003)+, Muskingum (05040004)+, Wills (05040005)+, Greenbrier (05050003)+, Lower New (05050004)+, Lower Kanawha (05050008)+, Upper Scioto (05060001)+, Lower Scioto (05060002)+, Paint (05060003)+, Big Sandy (05070204)+, Whitewater (05080003)+, Ohio Brush-Whiteoak (05090201)+, Middle Ohio-Laughery (05090203)+, Licking (05100101)+, Lower Kentucky (05100205)+, Upper Green (05110001)+, Barren (05110002)+, Middle Green (05110003)+, Rough (05110004)+, Lower Green (05110005)+, Pond (05110006)+, Upper Wabash (05120101)+, Salamonie (05120102)+, Mississinewa (05120103)+, Eel (05120104)+, Middle Wabash-Deer (05120105)+, Tippecanoe (05120106)+, Wildcat (05120107)+, Middle Wabash-Little Vermilion (05120108)+, Vermilion (05120109)+, Sugar (05120110)+, Middle Wabash-Busseron (05120111)+, Embarras (05120112)+, Lower Wabash (05120113)+, Little

	Wabash (05120114)+, Skillet (05120115)+, Upper White (05120201)+, Lower White (05120202)+, Eel (05120203)+, Driftwood (05120204)+, Flatrock-Haw (05120205)+, Upper East Fork White (05120206)+, Muscatatuck (05120207)+, Lower East Fork White (05120208)+, Patoka (05120209)+, Upper Cumberland (05130101)+, Obey (05130105)+, Upper Cumberland-Cordell Hull (05130106)+, Caney (05130108)+, Lower Cumberland-Old Hickory Lake (05130201)+, Lower Cumberland-Sycamore (05130202)+*, Stones (05130203)+, Harpeth (05130204)+*, Lower Cumberland (05130205)+, Red (05130206)+, Silver-Little Kentucky (05140101)+, Salt (05140102)+, Rolling Fork (05140103)+, Blue-Sinking (05140104)+, Lower Ohio-Little Pigeon (05140201)+, Highland-Pigeon (05140202)+, Lower Ohio-Bay (05140203)+, Saline (05140204)+, Tradewater (05140205)+, Lower Ohio (05140206)+
06	North Fork Holston (06010101)+*, South Fork Holston (06010102)+, Watauga (06010103)+*, Holston (06010104)+, Pigeon (06010106)+, Lower French Broad (06010107)+, Watts Bar Lake (06010201)+, Upper Little Tennessee (06010202)+, Tuckasegee (06010203)+, Lower Little Tennessee (06010204)+, Upper Clinch (06010205)+*, Middle Tennessee-Chickamauga (06020001)+, Hiwassee (06020002)+, Ocoee (06020003)+, Sequatchie (06020004)+, Guntersville Lake (06030001)+, Wheeler Lake (06030002)+, Upper Elk (06030003)+, Lower Elk (06030004)+*, Pickwick Lake (06030005)+, Bear (06030006)+*, Lower Tennessee-Beech (06040001)+, Upper Duck (06040002)+, Lower Duck (06040003)+, Buffalo (06040004)+, Kentucky Lake (06040005)+, Lower Tennessee (06040006)+
07	Mississippi Headwaters (07010101)+, Leech Lake (07010102)+, Prairie-Willow (07010103)+, Elk-Nokasippi (07010104)+, Pine (07010105)+, Crow Wing (07010106)+, Redeye (07010107)+, Long Prairie (07010108)+, Platte-Spunk (07010201)+, Sauk (07010202)+, Clearwater-Elk (07010203)+, Crow (07010204)+, South Fork Crow (07010205)+, Twin Cities (07010206)+, Rum (07010207)+, Upper Minnesota (07020001)+, Pomme De Terre (07020002)+, Lac Qui Parle (07020003)+, Hawk-Yellow Medicine (07020004)+, Chippewa (07020005)+, Middle Minnesota (07020007)+, Cottonwood (07020008)+, Blue Earth (07020009)+, Watonwan (07020010)+, Le Sueur (07020011)+, Lower Minnesota (07020012)+, Upper St. Croix (07030001)+, Namekagon (07030002)+, Kettle (07030003)+, Snake (07030004)+, Lower St. Croix (07030005)+, Rush-Vermillion (07040001)+, Cannon (07040002)+, Buffalo-Whitewater (07040003)+, Zumbro (07040004)+, Trempealeau (07040005)+, La Crosse-Pine (07040006)+, Black (07040007)+, Root (07040008)+, Upper Chippewa (07050001)+, Flambeau (07050002)+, South Fork Flambeau (07050003)+, Jump (07050004)+, Lower Chippewa (07050005)+, Eau Claire (07050006)+, Red Cedar (07050007)+, Coon-Yellow (07060001)+, Upper Iowa (07060002)+, Grant-Little Maquoketa (07060003)+, Turkey (07060004)+, Apple-Plum (07060005)+, Maquoketa (07060006)+, Upper Wisconsin (07070001)+, Lake Dubay (07070002)+, Castle Rock (07070003)+, Baraboo (07070004)+, Lower Wisconsin (07070005)+, Kickapoo (07070006)+, Copperas-Duck (07080101)+, Upper Wapsipinicon (07080102)+, Lower Wapsipinicon (07080103)+, Flint-Henderson (07080104)+, South Skunk (07080105)+, North Skunk (07080106)+, Skunk (07080107)+, Upper Cedar (07080201)+, Shell Rock (07080202)+, Winnebago (07080203)+, West Fork Cedar (07080204)+, Middle Cedar (07080205)+, Lower Cedar (07080206)+, Upper Iowa (07080207)+, Middle Iowa (07080208)+, Lower Iowa (07080209)+, Upper Rock (07090001)+, Crawfish (07090002)+, Pecatonica (07090003)+, Sugar (07090004)+, Lower Rock (07090005)+, Kishwaukee (07090006)+, Des Moines Headwaters (07100001)+, Upper Des Moines (07100002)+, East Fork Des Moines (07100003)+, Middle Des Moines (07100004)+, Boone (07100005)+, North Raccoon (07100006)+, South Raccoon (07100007)+, Lake Red Rock (07100008)+, Lower Des Moines (07100009)+, Bear-Wyaconda (07110001)+, The Sny (07110004)+, North Fork Salt (07110005)+, South Fork Salt (07110006)+, Salt (07110007)+, Cuivre (07110008)+, Peruque-Piasa (07110009)+, Kankakee (07120001)+, Iroquois (07120002)+, Chicago (07120003)+, Des Plaines (07120004)+, Upper Illinois (07120005)+, Upper Fox (07120006)+, Lower Fox (07120007)+, Lower Illinois-Senachwine Lake (07130001)+, Vermilion (07130002)+, Lower Illinois-Lake Chautauqua (07130003)+, Mackinaw (07130004)+, Spoon (07130005)+, Upper Sangamon (07130006)+, South Fork Sangamon (07130007)+, Lower Sangamon (07130008)+, Salt (07130009)+, La Moine (07130010)+, Lower Illinois (07130011)+, Cahokia-Joachim (07140101)+, Meramec (07140102)+, Bourbeuse (07140103)+, Big (07140104)+, Upper Mississippi-Cape Girardeau (07140105)+, Big Muddy (07140106)+, Whitewater (07140107)+, Cache (07140108)+, Upper Kaskaskia (07140201)+, Middle Kaskaskia (07140202)+, Shoal (07140203)+, Lower Kaskaskia (07140204)+
08	Lower Mississippi-Memphis (08010100)+, Bayou De Chien-Mayfield (08010201)+, Obion (08010202)+, South Fork Obion (08010203)+*, Horn Lake-Nonconnah (08010211)+, Lower Mississippi-Helena (08020100)+, New Madrid-St. Johns (08020201)+, Upper St.

	Francis (08020202)+, Lower St. Francis (08020203)+, Little River Ditches (08020204)+, L'anguille (08020205)+, Cache (08020302)+, Lower White (08020303)+, Lower Arkansas (08020401)+, Bayou Meto (08020402)+, Lower Mississippi-Greenville (08030100)+, Little Tallahatchie (08030201)+, Yocona (08030203)+, Coldwater (08030204)+, Yalobusha (08030205)+, Upper Yazoo (08030206)+, Big Sunflower (08030207)+, Lower Yazoo (08030208)+*, Deer-Steele (08030209)+, Ouachita Headwaters (08040101)+, Little Missouri (08040103)+, Lower Ouachita-Bayou De Loutre (08040202)+, Upper Saline (08040203)+, Lower Saline (08040204)+, Bayou Bartholomew (08040205)+, Bayou D'arbonne (08040206)+, Lower Red (08040301)+, Castor (08040302)+, Little (08040304)+, Bayou Cocodrie (08040306)+, Boeuf (08050001)+, Bayou Macon (08050002)+*, Tensas (08050003)+, Lower Mississippi-Natchez (08060100)+, Lower Big Black (08060202)+, Coles Creek (08060204)+*, Homochitto (08060205)+, Buffalo (08060206)+, Lower Mississippi-Baton Rouge (08070100)+, Bayou Sara-Thompson (08070201)+, Amite (08070202)+, Tickfaw (08070203)+, Lake Maurepas (08070204)+, Tangipahoa (08070205)+, Lower Grand (08070300)+, Atchafalaya (08080101)+, Bayou Teche (08080102)+, Vermilion (08080103)+, Mermentau (08080202)+, Upper Calcasieu (08080203)+, Whisky Chitto (08080204)+, Lower Calcasieu (08080206)+, Liberty Bayou-Tchefuncta (08090201)+, Eastern Louisiana Coastal (08090203)+, East Central Louisiana Coastal (08090301)+, West Central Louisiana Coastal (08090302)+
09	Willow (09010004)+, Bois De Sioux (09020101)+, Mustinka (09020102)+, Otter Tail (09020103)+, Upper Red (09020104)+, Buffalo (09020106)+, Elm-Marsh (09020107)+, Eastern Wild Rice (09020108)+, Sandhill-Wilson (09020301)+, Red Lakes (09020302)+, Red Lake (09020303)+, Thief (09020304)+, Clearwater (09020305)+, Grand Marais-Red (09020306)+, Lower Red (09020311)+, Two Rivers (09020312)+, Roseau (09020314)+, Rainy Headwaters (09030001)+, Vermilion (09030002)+, Rainy Lake (09030003)+, Little Fork (09030005)+, Big Fork (09030006)+, Rapid (09030007)+, Lower Rainy (09030008)+, Lake of the Woods (09030009)+, St. Marys (09040001)+, Belly (09040002)+
10	Red Rock (10020001)+, Beaverhead (10020002)+, Ruby (10020003)+, Big Hole (10020004)+, Jefferson (10020005)+, Boulder (10020006)+, Madison (10020007)+, Gallatin (10020008)+, Upper Missouri (10030101)+, Upper Missouri-Dearborn (10030102)+, Smith (10030103)+, Sun (10030104)+, Belt (10030105)+, Two Medicine (10030201)+, Marias (10030203)+, Teton (10030205)+, Bullwhacker-Dog (10040101)+, Judith (10040103)+, Fort Peck Reservoir (10040104)+, Upper Musselshell (10040201)+, Middle Musselshell (10040202)+, Lower Milk (10050012)+, Porcupine (10050016)+, Prarie Elk-Wolf (10060001)+, Yellowstone Headwaters (10070001)+, Upper Yellowstone (10070002)+, Shields (10070003)+, Upper Yellowstone-Lake Basin (10070004)+, Stillwater (10070005)+, Clarks Fork Yellowstone (10070006)+, Upper Yellowstone-Pompeys Pillar (10070007)+, Upper Wind (10080001)+, Little Wind (10080002)+, Popo Agie (10080003)+, Muskrat (10080004)+, Lower Wind (10080005)+, Badwater (10080006)+, Upper Bighorn (10080007)+, Nowood (10080008)+*, Greybull (10080009)+*, Big Horn Lake (10080010)+, Dry (10080011)+, North Fork Shoshone (10080012)+, South Fork Shoshone (10080013)+, Shoshone (10080014)+, Lower Bighorn (10080015)+, Upper Tongue (10090101)+, Lower Tongue (10090102)+, Middle Fork Powder (10090201)+, Upper Powder (10090202)+, South Fork Powder (10090203)+, Salt (10090204)+, Crazy Woman (10090205)+, Clear (10090206)+, Middle Powder (10090207)+, Little Powder (10090208)+, Lower Powder (10090209)+, Mizpah (10090210)+, Lower Yellowstone-Sunday (10100001)+, Big Porcupine (10100002)+, Rosebud (10100003)+, Lower Yellowstone (10100004)+, O'fallon (10100005)+, Upper Little Missouri (10110201)+, Boxelder (10110202)+, Middle Little Missouri (10110203)+*, Lower Little Missouri (10110205)+, Antelope (10120101)+*, Angostura Reservoir (10120106)+, Beaver (10120107)+, Middle Cheyenne-Spring (10120109)+, Rapid (10120110)+, Middle Cheyenne-Elk (10120111)+, Lower Cheyenne (10120112)+, Cherry (10120113)+, Upper Belle Fourche (10120201)+, Lower Belle Fourche (10120202)+, Redwater (10120203)+, Painted Woods-Square Butte (10130101)+, Upper Lake Oahe (10130102)+, Lower Lake Oahe (10130105)+, West Missouri Coteau (10130106)+, Knife (10130201)+, South Fork Grand (10130302)+, Grand (10130303)+, Upper Moreau (10130305)+, Lower Moreau (10130306)+, Fort Randall Reservoir (10140101)+, Bad (10140102)+, Medicine Knoll (10140103)+, Medicine (10140104)+, Little White (10140203)+, Lower White (10140204)+, Ponca (10150001)+, Upper Niobrara (10150003)+, Middle Niobrara (10150004)+, Snake (10150005)+, Keya Paha (10150006)+, Lower Niobrara (10150007)+, Upper James (10160003)+, Mud (10160005)+, Middle James (10160006)+, Lower James (10160011)+, Lewis and Clark Lake (10170101)+, Vermillion (10170102)+, Middle Big Sioux Coteau (10170201)+, Upper Big Sioux (10170202)+, Lower Big Sioux (10170203)+, Rock (10170204)+, Upper North Platte (10180002)+, Pathfinder-Seminoe

	Reservoirs (10180003)+*, Medicine Bow (10180004)+, Little Medicine Bow (10180005)+, Sweetwater (10180006)+, Middle North Platte-Casper (10180007)+, Glendo Reservoir (10180008)+, Middle North Platte-Scotts Bluff (10180009)+, Upper Laramie (10180010)+, Lower Laramie (10180011)+, Lower North Platte (10180014)+, South Platte Headwaters (10190001)+, Upper South Platte (10190002)+*, Middle South Platte-Cherry Creek (10190003)+, St. Vrain (10190005)+, Cache La Poudre (10190007)+, Crow (10190009)+, Middle South Platte-Sterling (10190012)+*, Upper Lodgepole (10190015)+, Lower South Platte (10190018)+, Middle Platte-Buffalo (10200101)+, Middle Platte-Prairie (10200103)+, Lower Platte-Shell (10200201)+, Lower Platte (10200202)+, Salt (10200203)+, Upper Middle Loup (10210001)+, Lower Middle Loup (10210003)+, South Loup (10210004)+, Mud (10210005)+, Upper North Loup (10210006)+, Lower North Loup (10210007)+, Calamus (10210008)+, Loup (10210009)+, Cedar (10210010)+, Upper Elkhorn (10220001)+, North Fork Elkhorn (10220002)+, Lower Elkhorn (10220003)+, Logan (10220004)+, Blackbird-Soldier (10230001)+, Floyd (10230002)+, Little Sioux (10230003)+, Maple (10230005)+, Big Papillion-Mosquito (10230006)+, Boyer (10230007)+, Keg-Weeping Water (10240001)+, West Nishnabotna (10240002)+, East Nishnabotna (10240003)+, Tarkio-Wolf (10240005)+, South Fork Big Nemaha (10240007)+, Big Nemaha (10240008)+, West Nodaway (10240009)+, Nodaway (10240010)+, Independence-Sugar (10240011)+, Platte (10240012)+, One Hundred and Two (10240013)+, South Fork Republican (10250003)+, Upper Republican (10250004)+, Red Willow (10250007)+, Medicine (10250008)+, Harlan County Reservoir (10250009)+, Prairie Dog (10250015)+, Middle Republican (10250016)+, Lower Republican (10250017)+, Upper Smoky Hill (10260003)+, Middle Smoky Hill (10260006)+, Lower North Fork Solomon (10260012)+, Middle Kansas (10270102)+, Delaware (10270103)+, Lower Kansas (10270104)+, Middle Big Blue (10270202)+, West Fork Big Blue (10270203)+, Lower Big Blue (10270205)+, Upper Little Blue (10270206)+, Upper Grand (10280101)+, Thompson (10280102)+, Lower Grand (10280103)+, Upper Chariton (10280201)+, Lower Chariton (10280202)+, Little Chariton (10280203)+, Upper Marais Des Cygnes (10290101)+, Lower Marais Des Cygnes (10290102)+, Little Osage (10290103)+, Harry S. Missouri (10290105)+, Sac (10290106)+, Pomme De Terre (10290107)+, South Grand (10290108)+, Lake of the Ozarks (10290109)+, Niangua (10290110)+, Lower Osage (10290111)+, Upper Gasconade (10290201)+, Big Piney (10290202)+, Lower Gasconade (10290203)+, Lower Missouri-Crooked (10300101)+, Lower Missouri-Moreau (10300102)+, Lamine (10300103)+, Blackwater (10300104)+, Lower Missouri (10300200)+
11	Beaver Reservoir (11010001)+, James (11010002)+, Bull Shoals Lake (11010003)+, Middle White (11010004)+, North Fork White (11010006)+, Upper Black (11010007)+, Current (11010008)+, Spring (11010010)+, Eleven Point (11010011)+, Strawberry (11010012)+, Upper White-Village (11010013)+, Little Red (11010014)+, Upper Arkansas (11020002)+, Fountain (11020003)+, Upper Arkansas-Lake Meredith (11020005)+, Horse (11020008)+, Upper Arkansas-John Martin (11020009)+, Purgatoire (11020010)+, Two Butte (11020013)+, Pawnee (11030005)+, Cow (11030011)+, Middle Arkansas-Slate (11030013)+, North Fork Ninnescah (11030014)+, Upper Cimarron (11040002)+, Bear (11040005)+, Upper Cimarron-Liberal (11040006)+, Lower Cimarron-Skeleton (11050002)+, Kaw Lake (11060001)+, Lower Salt Fork Arkansas (11060004)+*, Black Bear-Red Rock (11060006)+, Fall (11070102)+, Caney (11070106)+, Bird (11070107)+, Upper Cottonwood (11070202)+, Upper Neosho (11070204)+, Middle Neosho (11070205)+, Lake O' the Cherokees (11070206)+, Spring (11070207)+, Elk (11070208)+, Lower Neosho (11070209)+, Cimarron (11080002)+, Mora (11080004)+, Lower Canadian-Walnut (11090202)+, Little (11090203)+*, Lower Canadian (11090204)+, Upper Beaver (11100101)+, Middle Beaver (11100102)+*, Coldwater (11100103)+, Middle North Canadian (11100301)+, Lower North Canadian (11100302)+, Polecat-Snake (11110101)+, Dirty-Greenleaf (11110102)+, Illinois (11110103)+, Robert S. Kerr Reservoir (11110104)+, Poteau (11110105)+, Frog-Mulberry (11110201)+, Dardanelle Reservoir (11110202)+, Lake Conway-Point Remove (11110203)+, Lower Arkansas-Maumelle (11110207)+, Farmers-Mud (11130201)+, Northern Beaver (11130208)+, Washita headwaters (11130301)+, Upper Washita (11130302)+, Middle Washita (11130303)+, Bois D'arc-Island (11140101)+, Kiamichi (11140105)+, Pecan-Waterhole (11140106)+, Lower Little (11140109)+, Mckinney-Posten Bayous (11140201)+*, Loggy Bayou (11140203)+, Red Chute (11140204)+, Bodcau Bayou (11140205)+, Lower Red-Lake Iatt (11140207)+, Black Lake Bayou (11140209)+, Lower Sulphur (11140302)+, Cross Bayou (11140304)+
12	Middle Sabine (12010002)+, Lake Fork (12010003)+, Toledo Bend Reservoir (12010004)+, Lower Sabine (12010005)+, Upper Neches (12020001)+, Middle Neches (12020002)+, Lower Neches (12020003)+, Upper Angelina (12020004)+, Lower Angelina (12020005)+, Elm Fork

	Trinity (12030103)+, Upper Trinity (12030105)+, Cedar (12030107)+, Richland (12030108)+, Chambers (12030109)+, Lower Trinity-Tehuacana (12030201)+, Lower Trinity-Kickapoo (12030202)+, Lower Trinity (12030203)+, West Fork San Jacinto (12040101)+, Spring (12040102)+, Buffalo-San Jacinto (12040104)+, East Galveston Bay (12040202)+, North Galveston Bay (12040203)+, Austin-Oyster (12040205)+, Navasota (12070103)+, Lower Brazos (12070104)+, Lampasas (12070203)+, San Saba (12090109)+, Buchanan-Lyndon B (12090201)+, Lower Colorado-Cummins (12090301)+, Lower Colorado (12090302)+, San Bernard (12090401)+, East Matagorda Bay (12090402)+, Lavaca (12100101)+, Navidad (12100102)+, Lower Guadalupe (12100204)+, Lower San Antonio (12100303)+, West Matagorda Bay (12100402)+, East San Antonio Bay (12100403)+
13	Rio Grande headwaters (13010001)+, Alamosa-Trinchera (13010002)+*, San Luis (13010003)+*, Saguache (13010004)+, Conejos (13010005)+, Rio Grande-Albuquerque (13020203)+, Caballo (13030101)+
14	Colorado headwaters (14010001)+, Eagle (14010003)+, Roaring Fork (14010004)+, Colorado headwaters-Plateau (14010005)+, East-Taylor (14020001)+*, Westwater Canyon (14030001)+, Upper Dolores (14030002)+, San Miguel (14030003)+, Upper Colorado-Kane Springs (14030005)+*, Upper Green (14040101)+, New Fork (14040102)+, Upper Green-Slate (14040103)+, Big Sandy (14040104)+, Bitter (14040105)+, Upper Green-Flaming Gorge Reservoir (14040106)+, Blacks Fork (14040107)+, Muddy (14040108)+, Upper Yampa (14050001)+, Little Snake (14050003)+, Muddy (14050004)+, Upper White (14050005)+, Piceance-Yellow (14050006)+*, Lower White (14050007)+, Lower Green-Diamond (14060001)+, Ashley-Brush (14060002)+, Duchesne (14060003)+, Strawberry (14060004)+, Lower Green-Desolation Canyon (14060005)+, Willow (14060006)+, Price (14060007)+, Lower Green (14060008)+, San Rafael (14060009)+, Upper Lake Powell (14070001)+*, Muddy (14070002)+*, Fremont (14070003)+, Dirty Devil (14070004)+*, Escalante (14070005)+, Upper San Juan (14080101)+, Piedra (14080102)+, Animas (14080104)+, Middle San Juan (14080105)+, Chaco (14080106)+, Mcelmo (14080202)+, Chinle (14080204)+, Lower San Juan (14080205)+
15	Lower Colorado-Marble Canyon (15010001)+, Upper Virgin (15010008)+, Little Colorado headwaters (15020001)+, Silver (15020005)+, Upper Puerco (15020006)+, Chevelon Canyon (15020010)+, Canyon Diablo (15020015)+, Havasu-Mohave Lakes (15030101)+, Imperial Reservoir (15030104)+, Big Sandy (15030201)+, Burro (15030202)+, Bill Williams (15030204)+, San Francisco (15040004)+, Upper Gila-San Carlos Reservoir (15040005)+, San Carlos (15040007)+, Middle Gila (15050100)+, Lower San Pedro (15050203)+, Black (15060101)+, Upper Salt (15060103)+, Tonto (15060105)+, Lower Salt (15060106)+, Upper Verde (15060202)+, Lower Verde (15060203)+, Agua Fria (15070102)+
16	Upper Bear (16010101)+, Central Bear (16010102)+, Bear Lake (16010201)+, Middle Bear (16010202)+, Little Bear-Logan (16010203)+, Lower Bear-Malad (16010204)+, Upper Weber (16020101)+, Lower Weber (16020102)+, Utah Lake (16020201)+, Spanish Fork (16020202)+, Provo (16020203)+, Jordan (16020204)+, Pine Valley (16020302)+, Rush-Tooele Valleys (16020304)+, Skull Valley (16020305)+, Southern Great Salt Lake Desert (16020306)+, Northern Great Salt Lake Desert (16020308)+, Curlew Valley (16020309)+, Great Salt Lake (16020310)+, Upper Sevier (16030001)+, East Fork Sevier (16030002)+, Middle Sevier (16030003)+, San Pitch (16030004)+, Lower Sevier (16030005)+, Escalante Desert (16030006)+, Beaver Bottoms-Upper Beaver (16030007)+, Lower Beaver (16030008)+, Sevier Lake (16030009)+, Lake Tahoe (16050101)+, Truckee (16050102)+, Upper Carson (16050201)+, Middle Carson (16050202)+, West Walker (16050302)+
17	Upper Kootenai (17010101)+, Fisher (17010102)+, Yaak (17010103)+, Lower Kootenai (17010104)+, Moyie (17010105)+, Upper Clark Fork (17010201)+, Flint-Rock (17010202)+, Blackfoot (17010203)+, Middle Clark Fork (17010204)+, Bitterroot (17010205)+, North Fork Flathead (17010206)+, Middle Fork Flathead (17010207)+, Flathead Lake (17010208)+, South Fork Flathead (17010209)+, Stillwater (17010210)+, Swan (17010211)+, Lower Flathead (17010212)+, Lower Clark Fork (17010213)+, Pend Oreille Lake (17010214)+, Priest (17010215)+, Pend Oreille (17010216)+, Upper Coeur D'alene (17010301)+, Coeur D'alene Lake (17010303)+, St. Joe (17010304)+, Upper Spokane (17010305)+, Lower Spokane (17010307)*, Little Spokane (17010308)*, Franklin D. Roosevelt Lake (17020001)*, Kettle (17020002)*, Colville (17020003)*, Sanpoil (17020004)*, Chief Joseph (17020005)*, Okanogan (17020006)*, Similkameen (17020007)*, Methow (17020008)*, Lake Chelan (17020009)*, Upper Columbia-Entiat (17020010)*, Wenatchee (17020011)*, Upper Crab (17020013)*, Banks Lake (17020014)*, Lower Crab (17020015)*, Upper Columbia-Priest Rapids (17020016)*, Upper Yakima (17030001)*, Naches (17030002)*, Lower Yakima,

	Washington (17030003)*, Snake headwaters (17040101)+, Gros Ventre (17040102)+, Greys-Hobock (17040103)+, Palisades (17040104)+, Salt (17040105)+, Idaho Falls (17040201)+, Upper Henrys (17040202)+, Lower Henrys (17040203)+, Teton (17040204)+, Willow (17040205)+, American Falls (17040206)+, Blackfoot (17040207)+, Portneuf (17040208)+, Lake Walcott (17040209)+, Raft (17040210)+, Upper Snake-Rock (17040212)+, Salmon Falls (17040213)+*, Beaver-Camas (17040214)+, Big Lost (17040218)+, Big Wood (17040219)+, Little Wood (17040221)+, Middle Snake-Succor (17050103)+, Upper Owyhee (17050104)+, East Little Owyhee. Nevada, (17050106)+, Middle Owyhee (17050107)+, Jordan (17050108)+, Boise-Mores (17050112)+, South Fork Boise (17050113)+, Lower Boise (17050114)+, Middle Snake-Payette (17050115)+, Upper Malheur (17050116)+, South Fork Payette (17050120)+, Payette (17050122)+, North Fork Payette (17050123)+, Weiser (17050124)+, Brownlee Reservoir (17050201)+, Burnt (17050202)+, Powder (17050203)+, Hells Canyon (17060101)+, Lower Snake-Asotin (17060103)+, Upper Grande Ronde (17060104)+, Wallowa (17060105)+, Lower Grande Ronde (17060106)+, Palouse (17060108)*, Rock (17060109)*, Upper Salmon (17060201)+, Pahsimeroi (17060202)+, Middle Salmon-Panther (17060203)+, Lemhi (17060204)+, Upper Middle Fork Salmon (17060205)+, South Fork Salmon (17060208)+, Lower Salmon (17060209)+, Middle Fork Clearwater (17060304)+, South Fork Clearwater (17060305)+, Clearwater (17060306)+, Lower North Fork Clearwater (17060308)+, Middle Columbia-Lake Wallula (17070101)+*, Umatilla (17070103)+*, Middle Columbia-Hood (17070105)+, Klickitat (17070106)*, Upper John Day (17070201)+, North Fork John Day (17070202)+, Middle Fork John Day (17070203)+, Upper Deschutes (17070301)+, Little Deschutes (17070302)+, Beaver-South Fork (17070303)+, Upper Crooked (17070304)+, Lower Crooked (17070305)+, Lower Deschutes (17070306)+, Trout (17070307)+, Lower Columbia-Sandy (17080001)+, Lewis (17080002)*, Lower Columbia-Clatskanie (17080003)+, Upper Cowlitz (17080004)*, Lower Cowlitz (17080005)*, Lower Columbia (17080006)+, Middle Fork Willamette (17090001)+, Coast Fork Willamette (17090002)+, Upper Willamette (17090003)+, Mckenzie (17090004)+, North Santiam (17090005)+, South Santiam (17090006)+, Middle Willamette (17090007)+, Yamhill (17090008)+, Molalla-Pudding (17090009)+, Tualatin (17090010)+, Clackamas (17090011)+, Lower Willamette (17090012)+, Hoh-Quillayute (17100101)*, Queets-Quinault (17100102)*, Upper Chehalis (17100103)*, Lower Chehalis (17100104)*, Grays Harbor (17100105)*, Willapa Bay (17100106)*, Necanicum (17100201)+, Nehalem (17100202)+, Wilson-Trusk-Nestuccu (17100203)+, Siletz-Yaquina (17100204)+, Alsea (17100205)+, Siuslaw (17100206)+, Siltcoos (17100207)+, North Umpqua (17100301)+, South Umpqua (17100302)+, Umpqua (17100303)+, Coos (17100304)+, Coquille (17100305)+, Sixes (17100306)+, Upper Rogue (17100307)+, Middle Rogue (17100308)+, Applegate (17100309)+, Lower Rogue (17100310)+, Illinois (17100311)+, Fraser (17110001)*, Strait of Georgia (17110002)*, San Juan Islands (17110003)*, Nooksack (17110004)*, Upper Skagit (17110005)*, Sauk (17110006)*, Lower Skagit (17110007)*, Stillaguamish (17110008)*, Skykomish (17110009)*, Snoqualmie (17110010)*, Snohomish (17110011)*, Lake Washington (17110012)*, Duwamish (17110013)*, Puyallup (17110014)*, Nisqually (17110015)*, Deschutes (17110016)*, Skokomish (17110017)*, Hood Canal (17110018)*, Puget Sound (17110019)*, Dungeness-Elwha (17110020)*, Crescent-Hoko (17110021)*, Harney-Malheur Lakes (17120001)+, Silvies (17120002)+, Donner Und Blitzen (17120003)+, Silver (17120004)+, Summer Lake (17120005)+, Lake Abert (17120006)+, Warner Lakes (17120007)+
18	Smith (18010101)+*, Mad-Redwood (18010102)+, Upper Eel (18010103)+, Big-Navarro-Garcia (18010108)+, Williamson (18010201)+, Sprague (18010202)+, Upper Klamath Lake (18010203)+, Lost (18010204)+, Butte (18010205)+, Upper Klamath (18010206)+, Shasta (18010207)+, Lower Klamath (18010209)+, Trinity (18010211)+, South Fork Trinity (18010212)+, Goose Lake (18020001)+, Upper Pit (18020002)+, Lower Pit (18020003)+, Mccloud (18020004)+, Sacramento headwaters (18020005)+, Upper Stony (18020115)+, Upper Cache (18020116)+, North Fork Feather (18020121)+, East Branch North Fork Feather (18020122)+, Middle Fork Feather (18020123)+, Upper Yuba (18020125)+, North Fork American (18020128)+, South Fork American (18020129)+, Cottonwood Creek (18020152)+, Battle Creek (18020153)+, Clear Creek-Sacramento River (18020154)+, Paynes Creek-Sacramento River (18020155)+, Big Chico Creek-Sacramento River (18020157)+, Butte Creek (18020158)+, Honcut Headwaters-Lower Feather (18020159)+, Upper Putah (18020162)+, Middle Kern-Upper Tehachapi- (18030003)+, Middle San Joaquin-Lower (18040001)+, Middle San Joaquin-Lower (18040002)+, Upper San Joaquin (18040006)+, Upper Chowchilla-Upper Fresno (18040007)+, Upper Merced (18040008)+, Upper Tuolumne (18040009)+, Upper Stanislaus (18040010)+, Upper Calaveras (18040011)+, Upper Cosumnes (18040013)+, San Pablo Bay (18050002)+, San Francisco Bay (18050004)+,

	Pajaro (18060002)+, Salinas (18060005)+, Santa Ynez (18060010)+, Santa Clara (18070102)+, San Pedro Channel Islands (18070107)+, San Jacinto (18070202)+, Santa Ana (18070203)+, Santa Margarita (18070302)+, Madeline Plains (18080002)+, Honey-Eagle Lakes (18080003)+, Crowley Lake (18090102)+, Mojave (18090208)+

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: Bald eagle. Mature adults have a white head and tail.
General Description: Adults have a white head, white tail, and a large bright yellow bill; elsewhere the plumage is dark. Immatures are dark with variable amounts of light splotching on the body, underwing coverts, flight feathers, and tail base; averages 79-94 cm long, 178-229 cm wingspan (NGS 1983).
Diagnostic Characteristics: Adults differ from other eagles in having both a white head and white tail (head of white-tailed eagle may look white at a distance). Bald eagle has a proportionately larger head and bill than does the golden eagle, in the immatures of which the white is confined to the base of the primaries and the base of the tail. Bald eagle lacks the long wedge-shaped tail of Steller's sea-eagle. Bald eagle's neck is shorter and tail is longer than in white-tailed eagle.
Reproduction Comments: Clutch size is 1-3 (usually 2). Incubation lasts about 5 weeks, by both sexes. Second hatched young often dies. Young first fly at 10-12.5 weeks, cared for by adults and may remain around nest for several weeks after fledging. Generally first breeds at about 5-6 years. Adults may not lay every year.
Ecology Comments: Commonly roosts communally, especially in winter. See Curnutt (1992) for information on the dynamics of a year-round communal roost in southern Florida.

In Montana, the introduction of shrimp (MYSIS RELICTA) had a cascading effect through the food chain, ultimately causing displacement of bald eagles (Spencer et al. 1991).
Non-Migrant: Y
Locally Migrant: Y
Long Distance Migrant: Y
Mobility and Migration Comments: Most eagles that breed in Canada and the northern U.S. move south for winter. Migrates widely over most of North America (AOU 1983); moves generally E-SE across Canada and the Great Lakes region to the northeast coast of the U.S. In the northern Chesapeake Bay region, radio-tagged northern migrants arrived in late fall (mean date 21 December) and departed in early spring (mean date 27 March); radio-tagged southern migrants arrived throughout April-August and departed June-October (Buehler et al. 1991). See Palmer (1988) for fairly detailed review of seasonal movements in various regions.

Defended territories are relatively small; fourteen in Alaska varied from 11-45 hectares and averaged 23 ha (Hensel and Troyer 1964), and territory radius around active nests averaged 0.6 km in Minnesota (Mahaffy and Frenzel 1987). Feeding home ranges surrounding active nests are undoubtedly much larger, depending on proximity to food sources and abundance of food. Minimum home range of breeding birds in Saskatchewan was 7 square kilometers (Gerrard et al. 1992); on the Columbia River, Oregon, breeding home ranges averaged 21.6 square kilometers (Garrett et al. 1993).

Winter home ranges can be very large, especially for nonbreeding birds. An immature wintered in Arizona over an area of >40,000 square kilometers and spent the summer in the Northwest Territories over a summer range of >55,000 square kilometers (Grubb et al. 1994). Maximum distance between feeding area and night roost site was less than 16 km in winter in Missouri (Griffin et al. 1982). In north-central Arizona, February-April home range of immatures averaged 400 square kilometers; birds moved frequently and roosted singly or in small groups (Grubb et al. 1989).
Marine Habitat(s): Near shore
Estuarine Habitat(s): Bay/sound, Lagoon, River mouth/tidal river, Tidal flat/shore
Riverine Habitat(s): BIG RIVER, MEDIUM RIVER
Lacustrine Habitat(s): Deep water, Shallow water
Palustrine Habitat(s): FORESTED WETLAND, Riparian
Terrestrial Habitat(s): Cliff, Forest - Conifer, Forest - Hardwood, Forest - Mixed, Woodland - Conifer, Woodland - Hardwood, Woodland - Mixed
Special Habitat Factors: Standing snag/hollow tree
Habitat Comments: Breeding habitat most commonly includes areas close to (within 4 km) coastal areas, bays, rivers, lakes,

reservoirs, or other bodies of water that reflect the general availability of primary food sources including fish, waterfowl, or seabirds (Andrew and Mosher 1982, Green 1985, Campbell et al. 1990). For example, in Saskatchewan lakes, bald eagle density was positively correlated with abundance of large fishes (Dzus and Gerrard 1993).

Nests usually are in tall trees or on pinnacles or cliffs near water. Tree species used for nesting vary regionally and may include pine, spruce, fir, cottonwood, poplar, willow, sycamore, oak, beech, or others. Ground nesting has been reported on the Aleutian Islands in Alaska, in Canada's Northwest Territories, and in Ohio, Michigan, and Texas. The same nest may be used year after year, or a pair may use alternate nest sites in successive years. See Livingston et al. (1990) for a model of nesting habitat in Maine. See Wood et al. (1989) for characteristics of nesting habitat in Florida (most nests were in live pine trees). In Oregon, most nests were within 1.6 km of water, usually in the largest tree in a stand (Anthony and Isaacs 1989). In Colorado and Wyoming, forest stands containing nest trees varied from old-growth ponderosa pine to narrow strips of riparian vegetation surrounded by rangeland (Kralovec et al. 1992). In Arizona, recent nests were on cliffs or pinnacles, or in large cottonwoods, willows, sycamores, or ponderosa pines, usually within 1 km of a riparian corridor (J. T. Driscoll, in Corman and Wise-Gervais 2005).

In winter, bald eagles may associate with waterfowl concentrations or congregate in areas with abundant dead fish (Griffin et al. 1982) or other food resources. Wintering areas are commonly associated with open water though in some regions (e.g., Great Basin) some bald eagles use habitats with little or no open water (e.g., montane areas) if upland food resources (e.g. rabbit or deer carrion, livestock afterbirths) are readily available (GBBO 2010). Wintering eagles tend to avoid areas with high levels of nearby human activity (boat traffic, pedestrians) and development (buildings) (Buehler et al. 1991). Bald eagles preferentially roost in conifers or other sheltered sites in winter in some areas; typically they select the larger, more accessible trees (Buehler et al. 1991, 1992). Perching in deciduous and coniferous trees is equally common in other areas (e.g., Bowerman et al. 1993). Communal roost sites used by two or more eagles are common, and some may be used by 100 or more eagles during periods of high use. Winter roost sites vary in their proximity to food resources (up to 33 km) and may be determined to some extent by a preference for a warmer microclimate at these sites. Available data indicate that energy conservation may or may not be an important factor in roost-site selection (Buehler et al. 1991). Communal night roosts often are in trees that are used in successive years.

Adult Food Habits: Carnivore, Piscivore
Immature Food Habits: Carnivore, Piscivore
Food Comments: Feeds opportunistically on fishes, injured waterfowl and seabirds, various mammals, and carrion (Terres 1980). See Haywood and Ohmart (1986), Kralovec et al. (1992), Brown (1993), and Grubb (1995) for diet of inland breeding populations in Arizona, Colorado, and Wyoming. Hunts live prey, scavenges, and pirates food from other birds (e.g., osprey) and, in Alaska, sea otter (Watt et al. 1995, Condor 97:588-590). See Palmer (1988) for further information on hunting methods. In the Columbia River estuary, tidal flats and water less than 4 m deep were important foraging habitats (Watson et al. 1991). See Caton et al. (1992) for information on foraging perches used in Montana. Sheep carcasses were significant food sources in winter in Oregon (Marr et al. 1995, Wilson Bulletin 107:251-257).
Adult Phenology: Crepuscular, Diurnal
Immature Phenology: Crepuscular, Diurnal
Phenology Comments: In the Columbia River estuary, foraging activity was most common at low tide and first daylight (Watson et al. 1991). In Arizona, foraging activity during the breeding season peaked at 0800-1000 and 1600-1900 MST (Grubb 1995).
Length: 94 centimeters
Weight: 5244 grams

Economic Attributes Expand

Management Summary Expand

Population/Occurrence Delineation Expand

Population/Occurrence Viability Expand

U.S. Invasive Species Impact Rank (I-Rank) Not yet assessed

Authors/Contributors Expand

References Expand

Use Guidelines & Citation

Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Lynx canadensis - Kerr, 1792
Canadian Lynx
Other English Common Names: Canada Lynx
Synonym(s): *Felis canadensis* ;*Felis lynx canadensis* ;*Felis lynx*
Taxonomic Status: Accepted
Related ITIS Name(s): *Lynx canadensis* Kerr, 1792 (TSN 180585)
French Common Names: lynx du Canada
Unique Identifier: ELEMENT_GLOBAL.2.102126
Element Code: AMAJH03010
Informal Taxonomy: Animals, Vertebrates - Mammals - Carnivores

View image report from CalPhoto

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Mammalia	Carnivora	Felidae	Lynx

Genus Size: B - Very small genus (2-5 species)

Check this box to expand all report sections: ☐

Concept Reference — Expand

Conservation Status — Collapse

NatureServe Status

Global Status: G5
Global Status Last Reviewed: 21Feb2000
Global Status Last Changed: 19Nov1996
Rounded Global Status: G5 - Secure
Reasons: Large range in northern North America; declines have occurred in some populations, but apparently still widespread and relatively abundant in most of historic range, though population data are lacking for many areas; habitat loss/fragmentation and susceptibility to overharvest are the major concerns.

In the contiguous U.S., overall numbers and range are substantially reduced from historical levels. At present, numbers have not recovered from overexploitation by both regulated and unregulated harvest that occurred in the 1970s and 1980s. Forest management practices that result in the loss of diverse age structure, fragmentation, roading, urbanization, agriculture,

recreational developments, and unnatural fire frequencies have altered suitable habitat in many areas. As a result, many states may have insufficient habitat quality and/or quantity to sustain lynx or their prey. Human access into habitat has increased dramatically over the last few decades contributing to direct and indirect mortality and displacement from suitable habitat. Although legal take is highly restricted, existing regulatory mechanisms may be inadequate to protect small, remnant populations or to conserve habitat. Competition with bobcats and coyotes may be a concern in some areas.
Nation: United States
National Status: N4? (15Jan1997)
Nation: Canada
National Status: N5 (30Dec2011)

U.S. & Canada State/Province Status	
United States	Alaska (S4), Colorado (S1), Idaho (S1), Indiana (SX), Maine (S2), Massachusetts (SX), Michigan (S1), Minnesota (SNR), Montana (S3), Nevada (SX), New Hampshire (S1), New York (SX), North Dakota (SU), Ohio (SX), Oregon (S1?), Pennsylvania (SX), Utah (S2), Vermont (S1), Washington (S1), Wyoming (S1)
Canada	Alberta (S4), British Columbia (S4), Labrador (S4), Manitoba (S5), New Brunswick (S1), Newfoundland Island (S3S4), Northwest Territories (S5), Nova Scotia (S1), Nunavut (SNR), Ontario (S5), Prince Edward Island (SX), Quebec (S5), Saskatchewan (S5), Yukon Territory (S5)

Other Statuses

Implied Status under the U.S. Endangered Species Act (USESA): PS:LT
Comments on USESA: USFWS (Federal Register, 26 August 1994) found that federal listing of the North American population may be warranted and initiated a formal status review. USFWS (Federal Register, 27 May 1997) determined that listing of the contiguous U.S. population is warranted but precluded by other higher priority actions. USFWS (Federal Register, 8 July 1998) proposed listing the U.S. lower 48 population segment as threatened. USFWS (Federal Register, 8 July 1999) extended for not more than six months a decision to list the contiguous United State population segment as a threatened species; this extension was made to allow time to resolve a dispute over the status of the U.S. lower 48 lynx population. USFWS (2000) determined threatened status for the contiguous U.S. distinct population segment of *L. canadensis*.

USFWS (2006) designated critical habitat for the contiguous U.S. distinct population segment. In total, approximately 1.841 square miles (4,768 square kilometers) fall within the boundaries of the critical habitat designation, in three units in the States of Minnesota, Montana and Washington (Federal Register, 9 November 2006).
U.S. Fish & Wildlife Service Lead Region: R6 - Rocky Mountain
Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Not at Risk (01May2001)
IUCN Red List Category: LC - Least concern
Convention on International Trade in Endangered Species Protection Status (CITES): Appendix II

NatureServe Global Conservation Status Factors

Range Extent: >2,500,000 square km (greater than 1,000,000 square miles)
Range Extent Comments: Throughout Alaska and Canada (except arctic islands) south through the Rocky Mountains, northern Great Lakes region, and northern New England. Also northern Eurasia if regarded as conspecific with LYNX LYNX (=FELIS LYNX). See U.S. Fish and Wildlife Service (1998) for information on distribution and relative abundance in the contiguous U.S. Considered historically resident in 16 states represented by five ecologically distinct regions: Cascade Range (Washington, Oregon), northern Rocky Mountains (northeastern Washington, southeastern Oregon, Idaho, Montana, western Wyoming, northern Utah), southern Rocky Mountains (southeastern Wyoming, Colorado), northern Great Lakes (Minnesota, Wisconsin, Michigan), and northern New England (Maine, New Hampshire, Vermont, New York, Pennsylvania, Massachusetts). Resident populations currently exist only in Maine, Montana, Washington, and possibly Minnesota; considered extant but no longer sustaining self-support populations in Wisconsin, Michigan, Oregon, Idaho, Wyoming, Utah, and Colorado; may be extirpated from New Hampshire, Vermont, New York, Pennsylvania, and Massachusetts (U.S. Fish and Wildlife Service 1998). See Stardom (1988 COSEWIC report) for information on distribution and relative abundance in Canada, where still widespread and relatively abundant in most of historic range. See USFWS (2000) for a state-by-state review of historical and current distribution.

Number of Occurrences: 81 to >300
Number of Occurrences Comments: Unknown, but numerous--Nearctic (or Holarctic) distribution.

Population Size: 10,000 to >1,000,000 individuals
Population Size Comments: Total population size is unknown, but it varies cyclically with availability of food; total probably is at least in the hundreds of thousands during population peaks, based on annual harvests in Canada that periodically exceed 50,000 (Nowak 1991). British Columbia population was estimated to vary between 200,000 and 250,000 (Goodchild and Munro 1980). See Stardom (1988 COSEWIC report) for information on status in Canada. In the contiguous U.S., total population size is unknown, but probably less than 2,000. Colorado: only 18 positive recordrds; none since 1973; proposing to reintroduce lynx (Colorado Division of Wildlife 1997). Idaho: less than 100 individuals (C. Harris, pers. comm., 1997). Maine: less than 200 individuals (C. McLaughlin, pers. comm., 1997). Oregon: perhaps fewer than 75 individuals (E. Gaines, pers. comm., 1997). Utah: very rare, few if any extant occurrences (G. Oliver, pers. comm., 1997). Montana: 740-1040 individuals (B. Giddings, pers. comm., 1998). Washington: 72-191 individuals (Washington Department of Wildlife 1993, Washington Department of Natural Resources 1996). Wyoming: less than 100 individuals (B. Oakleaf, pers. comm., 1998). Periodic increases in lynx numbers may be accentuated by dispersal of transient animals from Canadian populations (U.S. Fish and Wildlife Service 1998). It has been suggested that, because lynx occurrence throughout much of the continguous U.S. is on the southern periphery of the species' range, the presence of lynx is solely a consequence of dispersal from Canada and that most of the U.S. may never have supported self-sustaining, resident populations over time (U.S. Fish and Wildlife Service 1998).

Overall Threat Impact Comments: In determining threatened status for the contiguous U.S. distinct population segment, USFWS (2000) cited the inadequacy of existing regulatory mechanisms. "Current U.S. Forest Service Land and Resource Management Plans include programs, practices, and activities within the authority and jurisdiction of federal land management agencies that may threaten lynx or lynx habitat. The lack of protection for lynx in these plans render[s] them inadequate to protect the species" (USFWS 2000). Past extensive logging that eliminated habitat for lynx and snowshoe hare was detrimental. Habitat has been lost due to suppression of forest fires and ecological succession to habitats that no longer support snowshoe hare and lynx. Fragmentation, due to forestry, agriculture, and roads, and the subsequent isolation of suitable habitat is a concern. Lack of immigration from Canadian lynx populations is an important factor in some regions. Past excessive trapping of lynx (as recently as the 1970s and 1980s) depressed populations and may have been detrimental to local lynx populations in Washington (see U.S. Forest Service et al. 1993) and elsewhere (U.S. Fish and Wildlife Service 1998). Road construction causes habitat fragmentation and allows increased human access into lynx habitat; this may increase lynx mortality by facilitating access to hunters and trappers (although there is no legal harvest except for two lynx per year in Montana); incidental harvest of lynx in the course of legal trapping/hunting for other species may be a problem in some areas. Increased winter recreation (snowmobiles, ski area development) may be causing displacement and/or incidental mortality of lynx. Habitat changes and increased access into lynx habitats has resulted in increased competition and displacement of lynx by bobcat and coyote in some areas.

Short-term Trend Comments: Regionally variable. Local densities fluctuate with hare densities in core of range in Alaska and Canada; this has not been demonstrated for populations on the southern periphery of the range in the contiguous U.S. Periodic increases in lynx numbers in the contiguous United States may be accentuated by dispersal of transient animals from Canadian populations. USFWS (2000) presented a state by state review of status in the contiguous U.S.

Other NatureServe Conservation Status Information

Inventory Needs: Continue monitoring of populations.

Protection Needs: Protect from overharvest.

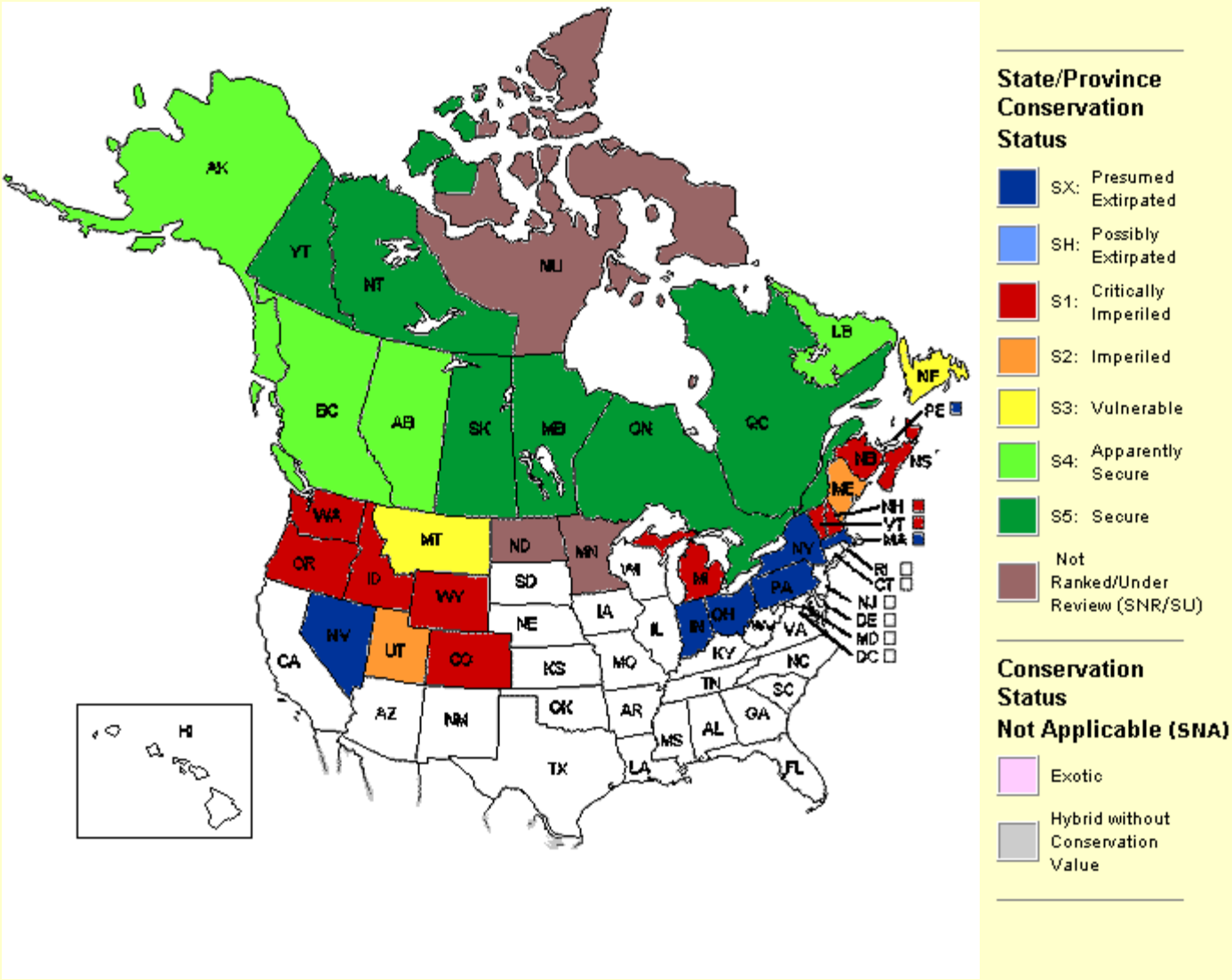
Distribution

Collapse

Global Range: (>2,500,000 square km (greater than 1,000,000 square miles)) Throughout Alaska and Canada (except arctic islands) south through the Rocky Mountains, northern Great Lakes region, and northern New England. Also northern Eurasia if regarded as conspecific with LYNX LYNX (=FELIS LYNX). See U.S. Fish and Wildlife Service (1998) for information on distribution and relative abundance in the contiguous U.S. Considered historically resident in 16 states represented by five ecologically distinct regions: Cascade Range (Washington, Oregon), northern Rocky Mountains (northeastern Washington, southeastern Oregon, Idaho, Montana, western Wyoming, northern Utah), southern Rocky Mountains (southeastern Wyoming,

Colorado), northern Great Lakes (Minnesota, Wisconsin, Michigan), and northern New England (Maine, New Hampshire, Vermont, New York, Pennsylvania, Massachusetts). Resident populations currently exist only in Maine, Montana, Washington, and possibly Minnesota; considered extant but no longer sustaining self-support populations in Wisconsin, Michigan, Oregon, Idaho, Wyoming, Utah, and Colorado; may be extirpated from New Hampshire, Vermont, New York, Pennsylvania, and Massachusetts (U.S. Fish and Wildlife Service 1998). See Stardom (1988 COSEWIC report) for information on distribution and relative abundance in Canada, where still widespread and relatively abundant in most of historic range. See USFWS (2000) for a state-by-state review of historical and current distribution.

U.S. States and Canadian Provinces

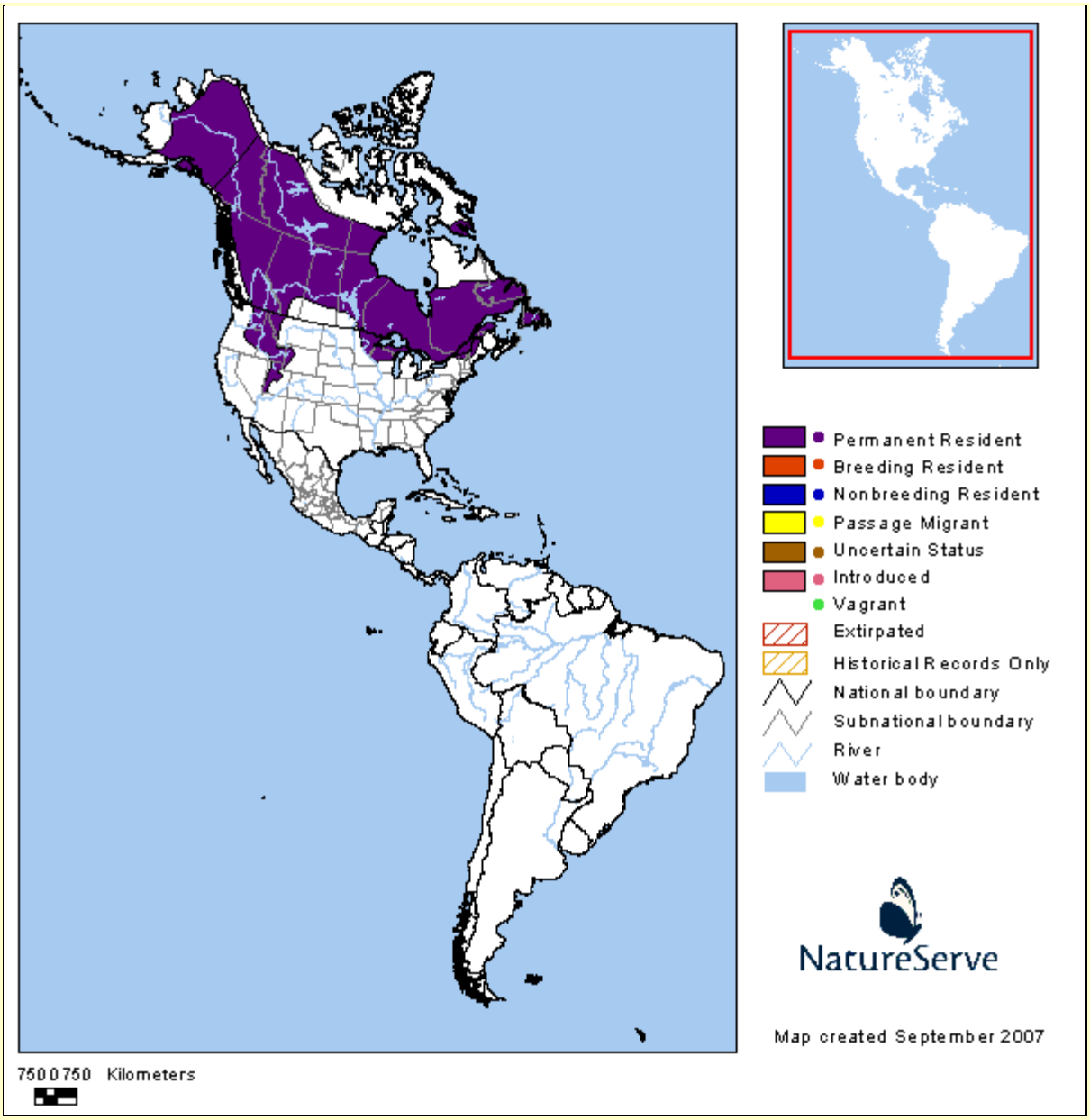


Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	AK, CO, ID, IN, MA, ME, MI, MN, MT, ND, NH, NV, NY, OH, OR, PA, UT, VT, WA, WY
Canada	AB, BC, LB, MB, NB, NF, NS, NT, NU, ON, PE, QC, SK, YT

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: Sechrest, 2002

U.S. Distribution by County	
State	**County Name (FIPS Code)**
CO	Archuleta (08007)*, Chaffee (08015)*, Clear Creek (08019)*, Conejos (08021)*, Costilla (08023), Eagle (08037), Garfield (08045), Grand (08049)*, Gunnison (08051)*, Hinsdale (08053)*, Huerfano (08055), Jackson (08057)*, La Plata (08067)*, Lake (08065)*, Larimer (08069), Mineral (08079)*, Moffat (08081)*, Montezuma (08083), Ouray (08091)*, Park (08093)*, Pitkin (08097)*, Rio Blanco (08103)*, Routt (08107), San Juan (08111)*, Summit (08117)
ID	Adams (16003), Bear Lake (16007)*, Blaine (16013), Boise (16015), Bonner (16017), Bonneville (16019), Boundary (16021), Butte (16023)*, Camas (16025), Caribou (16029), Clark (16033), Clearwater (16035), Custer (16037), Elmore (16039), Fremont (16043), Idaho (16049), Jerome (16053)*, Kootenai (16055)*, Latah (16057), Lemhi (16059), Lewis (16061)*, Nez Perce (16069), Oneida (16071)*, Power (16077), Shoshone (16079), Teton (16081), Twin Falls (16083)*, Valley (16085)
MI	Keweenaw (26083)*, Mackinac (26097)*
MT	Carbon (30009), Flathead (30029), Gallatin (30031), Granite (30039), Lincoln (30053), Missoula (30063), Park (30067), Powell (30077), Stillwater (30095), Sweet Grass (30097)
ND	Foster (38031)*, Stutsman (38093)*

OR	Grant (41023), Umatilla (41059)
PA	Tioga (42117)*
UT	Cache (49005), Daggett (49009)*, Emery (49015), Sanpete (49039), Sevier (49041), Summit (49043)*, Uintah (49047)*, Wasatch (49051)*
VT	Essex (50009)
WA	Chelan (53007)+*, Columbia (53013)+*, Douglas (53017)+*, Ferry (53019)+*, Jefferson (53031)+*, King (53033)+*, Kittitas (53037)+*, Klickitat (53039)+*, Okanogan (53047)+*, Pend Oreille (53051)+*, Skagit (53057)+*, Skamania (53059)+*, Snohomish (53061)+*, Spokane (53063)+*, Stevens (53065)+*, Whatcom (53073)+*, Whitman (53075)+*, Yakima (53077)+*
WY	Albany (56001), Big Horn (56003)*, Carbon (56007), Converse (56009)*, Fremont (56013), Johnson (56019)*, Lincoln (56023), Park (56029), Sheridan (56033)*, Sublette (56035), Sweetwater (56037)*, Teton (56039), Uinta (56041)*, Weston (56045)*

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
01	Upper Connecticut (01080101)+
02	Pine (02050205)+*
04	Carp-Pine (04070002)+*, St. Francois River (04150500)+
09	Middle Sheyenne (09020203)+*
10	Madison (10020007)+, Gallatin (10020008)+, Yellowstone Headwaters (10070001)+, Upper Yellowstone (10070002)+, Stillwater (10070005)+, Clarks Fork Yellowstone (10070006)+, Upper Wind (10080001)+, Little Wind (10080002)+, Popo Agie (10080003)+, Muskrat (10080004)+*, Greybull (10080009)+*, Big Horn Lake (10080010)+*, North Fork Shoshone (10080012)+, Little Bighorn (10080016)+*, Upper Tongue (10090101)+*, Crazy Woman (10090205)+*, Clear (10090206)+*, Beaver (10120107)+*, James Headwaters (10160001)+*, North Platte Headwaters (10180001)+*, Upper North Platte (10180002)+, Medicine Bow (10180004)+, Glendo Reservoir (10180008)+*, Upper Laramie (10180010)+, South Platte Headwaters (10190001)+*, Upper South Platte (10190002)+*, Clear (10190004)+*, Cache La Poudre (10190007)+, Crow (10190009)+*
11	Arkansas Headwaters (11020001)+*, Huerfano (11020006)+
13	Alamosa-Trinchera (13010002)+, Conejos (13010005)+*, Rio Chama (13020102)+*
14	Colorado headwaters (14010001)+, Blue (14010002)+, Eagle (14010003)+, Roaring Fork (14010004)+*, Colorado headwaters-Plateau (14010005)+*, East-Taylor (14020001)+*, Upper Gunnison (14020002)+*, North Fork Gunnison (14020004)+*, Uncompahange (14020006)+*, Upper Dolores (14030002)+, Upper Green (14040101)+, New Fork (14040102)+, Upper Green-Slate (14040103)+*, Big Sandy (14040104)+*, Upper Green-Flaming Gorge Reservoir (14040106)+*, Blacks Fork (14040107)+, Muddy (14040108)+*, Upper Yampa (14050001)+, Little Snake (14050003)+, Upper White (14050005)+*, Ashley-Brush (14060002)+*, Strawberry (14060004)+*, San Rafael (14060009)+, Fremont (14070003)+, Upper San Juan (14080101)+*, Piedra (14080102)+*, Animas (14080104)+*, Middle San Juan (14080105)+*, Mancos (14080107)+*
16	Upper Bear (16010101)+*, Central Bear (16010102)+, Bear Lake (16010201)+*, Middle Bear (16010202)+, Lower Bear-Malad (16010204)+*, Upper Weber (16020101)+*, Provo (16020203)+*
17	Upper Kootenai (17010101)+, Fisher (17010102)+, Yaak (17010103)+, Lower Kootenai (17010104)+, Moyie (17010105)+, Elk (17010106)+, Upper Clark Fork (17010201)+, Flint-Rock (17010202)+, Blackfoot (17010203)+, North Fork Flathead (17010206)+, Flathead Lake (17010208)+, Stillwater (17010210)+, Lower Flathead (17010212)+, Lower Clark Fork (17010213)+, Pend Oreille Lake (17010214)+*, Priest (17010215)+, Pend Oreille (17010216)+, Upper Coeur D'alene (17010301)+, Coeur D'alene Lake (17010303)+*, St. Joe (17010304)+, Upper Spokane (17010305)*, Little Spokane (17010308)*, Franklin D. Roosevelt Lake (17020001)*, Kettle (17020002)*, Colville (17020003)*, Sanpoil (17020004)*, Okanogan (17020006)*, Similkameen (17020007)*, Methow (17020008)*, Lake Chelan (17020009)*, Upper Columbia-

	Entiat (17020010)*, Wenatchee (17020011)*, Upper Yakima (17030001)*, Naches (17030002)*, Lower Yakima, Washington (17030003)*, Snake headwaters (17040101)+, Gros Ventre (17040102)+, Greys-Hobock (17040103)+, Palisades (17040104)+, Salt (17040105)+, Upper Henrys (17040202)+, Lower Henrys (17040203)+, Teton (17040204)+, Blackfoot (17040207)+*, Lake Walcott (17040209)+, Upper Snake-Rock (17040212)+*, Beaver-Camas (17040214)+, Medicine Lodge (17040215)+, Little Lost (17040217)+*, Big Lost (17040218)+*, Big Wood (17040219)+, Little Wood (17040221)+*, North and Middle Forks Boise (17050111)+, South Fork Boise (17050113)+, South Fork Payette (17050120)+, North Fork Payette (17050123)+, Brownlee Reservoir (17050201)+, Lower Snake-Asotin (17060103)+, Upper Grande Ronde (17060104)+, Lower Snake-Tucannon (17060107)*, Palouse (17060108)+*, Upper Salmon (17060201)+, Pahsimeroi (17060202)+, Middle Salmon-Panther (17060203)+, Lemhi (17060204)+, Upper Middle Fork Salmon (17060205)+, Lower Middle Fork Salmon (17060206)+, Middle Salmon-Chamberlain (17060207)+, South Fork Salmon (17060208)+*, Lower Salmon (17060209)+, Little Salmon (17060210)+*, Upper Selway (17060301)+*, Lochsa (17060303)+, Middle Fork Clearwater (17060304)+, South Fork Clearwater (17060305)+, Clearwater (17060306)+, Upper North Fork Clearwater (17060307)+, Middle Columbia-Hood (17070105)*, North Fork John Day (17070202)+, Lewis (17080002)*, Queets-Quinault (17100102)*, Upper Skagit (17110005)*, Stillaguamish (17110008)*, Snoqualmie (17110010)*, Lake Washington (17110012)*

\+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: A medium-sized cat.
Reproduction Comments: Breeds in late winter-early spring in North America. Gestation lasts 62-74 days. Litter size averages 3-4; adult females produce one litter every 1-2 years. Young stay with mother until next mating season or longer. Some females give birth as yearlings, but their pregnancy rate is lower than that of older females (Brainerd 1985). Prey scarcity suppresses breeding and may result in mortality of nearly all young (Brand and Keith 1979).
Ecology Comments: Home range increases, and individuals may become nomadic, when prey is scarce (Ward and Krebs 1985, Saunders 1963, Mech 1980). Range of male (average often about 15-30 sq km, but up to hundreds of sq km in Alaska and Minnesota) is larger than that of female. Spatial organization observed prior to low hare densities in Northwest Territories may be described as a land-tenure system, based on prior residency, and may have served to regulate density during peak prey levels (Poole 1995). Long distance dispersal movements of up to several hundred kilometers have been recorded.

Population density usually is less than 10 (locally up to 20) per 100 sq km, depending on prey availability. Mean densities range between 2 and 9 per 100 sq km (McCord and Cardoza 1982).

Usually solitary.
Non-Migrant: Y
Locally Migrant: N
Long Distance Migrant: N
Palustrine Habitat(s): FORESTED WETLAND
Terrestrial Habitat(s): Alpine, Forest - Conifer, Forest - Mixed, Tundra, Woodland - Conifer, Woodland - Mixed
Special Habitat Factors: Standing snag/hollow tree
Habitat Comments: Generally occurs in boreal and montane regions dominated by coniferous or mixed forest with thick undergrowth, but also sometimes enters open forest, rocky areas, and tundra to forage for abundant prey. When inactive or birthing, occupies den typically in hollow tree, under stump, or in thick brush. Den sites tend to be in mature or old growth stands with a high density of logs (Koehler 1990, Koehler and Brittell 1990).

U.S. Forest Service et al. (1993) listed three primary habitat components for lynx in the Pacific Northwest: (1) foraging habitat (15-35-year-old lodgepole pine) to support snowshoe hare and provide hunting cover, (2) denning sites (patches of >200-year-old spruce and fir, generally less than 5 acres, and (3) dispersal/travel cover (variable in vegetation composition and structure).

Major limiting factor is abundance of snowshoe hare, which in turn is limited by availability of winter habitat (in the Pacific Northwest, primarily early successional lodgepole pine with trees at least 6 feet tall) (U.S. Forest Service et al. 1993).

Adult Food Habits: Carnivore
Immature Food Habits: Carnivore
Food Comments: Eats primarily small mammals and birds, particularly LEPUS AMERICANUS. Occasionally feeds on squirrels, small mammals, beaver, deer, moose, muskrat, and birds; some taken as carrion. May cache food for later use.
Adult Phenology: Crepuscular, Nocturnal
Immature Phenology: Crepuscular, Nocturnal
Phenology Comments: Mainly nocturnal. Most active from 2 hours after sunset to one hour after sunrise (Banfield 1974).
Length: 107 centimeters
Weight: 18100 grams

Economic Attributes — Not yet assessed

Management Summary — Expand

Population/Occurrence Delineation — Expand

Population/Occurrence Viability — Expand

U.S. Invasive Species Impact Rank (I-Rank) — Not yet assessed

Authors/Contributors — Expand

References — Expand

Use Guidelines & Citation — Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Myotis lucifugus - (Le Conte, 1831)
Little Brown Myotis

Google
Search for Images on Google

Other English Common Names: Little Brown Bat
Taxonomic Status: Accepted
Related ITIS Name(s): *Myotis lucifugus* (LeConte, 1831) (TSN 179988)
French Common Names: petite chauve-souris brune, vespertilion brun
Spanish Common Names: Un Murciélago
Unique Identifier: ELEMENT_GLOBAL.2.100473
Element Code: AMACC01010
Informal Taxonomy: Animals, Vertebrates - Mammals - Bats

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Mammalia	Chiroptera	Vespertilionidae	Myotis

Genus Size: D - Medium to large genus (21+ species)

Check this box to expand all report sections: ☐

Concept Reference

Expand

Conservation Status

Collapse

NatureServe Status

Global Status: G3
Global Status Last Reviewed: 23Jul2012
Global Status Last Changed: 23Jul2012
Ranking Methodology Used: Ranked by calculator
Rounded Global Status: G3 - Vulnerable
Reasons: Widespread in North America from Alaska-Canada boreal forest south through most of the contiguous United States to central Mexico; formerly very abundant, recently underwent severe decline in abundance in the core of the range in northeastern North America as a result of high mortality caused by an introduced, rapidly spreading fungal disease (white-nose syndrome). Version 3.09 of NatureServe's rank estimator yielded a rank of "G3?"
Nation: United States
National Status: N3 (23Jul2012)
Nation: Canada
National Status: N3 (18Sep2012)

U.S. & Canada State/Province Status	
	Alabama (S3), Alaska (S4), Arkansas (S3), California (S2S3), Colorado (S5), Connecticut (S5), Delaware (S5),

United States	District of Columbia (S4), Florida (SNR), Georgia (S3), Idaho (S5), Illinois (S5), Indiana (S4), Iowa (S4), Kansas (S3S4), Kentucky (S5), Maine (S5), Maryland (S5B,S5N), Massachusetts (S5), Michigan (S5), Minnesota (SNR), Mississippi (S2), Missouri (S4), Montana (S4), Nebraska (SNR), Nevada (S3), New Hampshire (S5), New Jersey (S5), New Mexico (S5), New York (S5), North Carolina (S3), North Dakota (SNR), Ohio (SNR), Oklahoma (S1), Oregon (S4), Pennsylvania (S1), Rhode Island (S5), South Carolina (S3?), South Dakota (S5), Tennessee (S5), Utah (S4), Vermont (S1), Virginia (S3), Washington (S4S5), West Virginia (S5), Wisconsin (S2S4), Wyoming (S5)
Canada	Alberta (S5), British Columbia (S5), Labrador (S4), Manitoba (S2N,S5B), New Brunswick (S4), Newfoundland Island (S4), Northwest Territories (S2), Nova Scotia (S4), Ontario (S4), Prince Edward Island (S5), Quebec (S1), Saskatchewan (S5B,S5M), Yukon Territory (S1S3)

Other Statuses

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Endangered (01Nov2013)
Comments on COSEWIC: Approximately 50% of the global range of this small bat is found in Canada. Sub-populations in the eastern part of the range have been devastated by White-nose Syndrome, a fungal disease caused by an introduced pathogen. This disease was first detected in Canada in 2010, and to date has caused a 94% overall decline in known numbers of hibernating Myotis bats in Nova Scotia, New Brunswick, Ontario, and Québec. The current range of White-nose Syndrome has been expanding at an average rate of 200-250 kilometres per year. At that rate, the entire Canadian population is likely to be affected within 12 to 18 years. There is no apparent containment of the northward or westward spread of the pathogen, and proper growing conditions for it exist throughout the remaining range.

Designated Endangered in an emergency assessment on February 3, 2012. Status re-examined and confirmed in November 2013.
IUCN Red List Category: LC - Least concern

NatureServe Global Conservation Status Factors

Range Extent: >2,500,000 square km (greater than 1,000,000 square miles)
Range Extent Comments: Wide range includes North America from the Alaska-Canada boreal forest south through most of the contiguous United States, though the species is generally absent fom the southern Great Plains region. Southwestern populations formerly assigned to this species have now been assigned to *M. occultus* (Piaggio et al. 2002; Wilson and Reeder 2005), so the southwestern boundary of the range includes southern California (except extreme southeast), Nevada, northern Utah, northern Colorado, and perhaps northeastern New Mexico (Piaggio et al. 2002; Valdez, pers. comm.).

The high density of caves in the Appalachian Mountain range and eastern Midwest (Culver et al. 1999) likely "support much larger populations of this species than in other parts in the species' range. The largest known colonies of little brown myotis are in the northeastern and mid-western United States, with the northeastern population considered the core range of the species" Kunz and Reichard 2010). Smaller populations occur in the southern and western United States (Davis et al. 1965).

Number of Occurrences: 81 to >300
Number of Occurrences Comments: This species is represented by a large number of occurrences (subpopulations and locations) well spread over a vast geographic range.

Population Size: 100,000 to >1,000,000 individuals
Population Size Comments: Total adult population size is unknown but certainly exceeds 100,000 and was estimated at around 6.5 million as of 2006 (Frick et al. 2010). Individual maternity colonies often include (or at least recently included) hundreds (sometimes thousands) of individuals. Population size is now much smaller.(see trend comments). For general information on population size in Mexico see Arita (1993).

Number of Occurrences with Good Viability/Integrity: Many to very many (41 to >125) occurrences with good viability

Overall Threat Impact: High - medium
Overall Threat Impact Comments: Primary threat is a recently recognized fungal pathogen that causes a generally fatal condition known as white-nose syndrome (WNS), which attacks hibernating bats and killed at least 1 million *M. lucifugus* in the four years following detection of WNS in 2006 (Frick et al. 2010, Kunz and Reichard 2010). WNS has spread rapidly

(confirmed in more than 100 bat hibernacula) and now has been documented throughout northeastern North America. The fungus that causes WNS (*Geomyces destructans*) likely was recently introduced from Europe (Warnecke et al. 2012).

Other threats include deforestation (Parker 1996, Parker et al. 1996), use of pesticides (Fenton and Barclay 1980, Agosta 2002), use of cyanide in mining (Helfferich 1991), and destruction of caves and shafts associated with karst topography (Agosta 2002), along with control measures being implemented in nursery colonies and collecting of bats for experimentation (Fenton and Barclay 1980).

Special precautions should be taken when mine and cave surveys are conducted during breeding periods and winter hibernation. Hibernating bats are sensitive to human disturbance (Thomas 1995). Disturbance during hibernation can cause bats to use up stored fat reserves and starve to death. Disturbance of breeding colonies can cause young to lose their grasp and fall to their death.

Short-term Trend: Decline of 50-80%
Short-term Trend Comments: Range-wide trend over the past three generations (probably roughly 25-30 years) is not precisely known, but abundance has declined severely in the eastern (core) portion of the range (Frick et al. 2010, Kunz and Reichard 2010). Population decreases in bats at infected hibernacula range from 30 to 99 percent annually, with a regional mean of 73 (Frick et al. 2010). The large majority of the global population of *M. lucufugus* occurs in the region now infected with WNS (Kunz and Reichard 2010).

Population is "in sharp decline due to the rapidly spreading white-nose syndrome (WNS) that has already resulted in several local extirpations and that is ultimately expected to cause regional and likely rangewide extinction of the little brown myotis in a very short ecological time frame...." Frick et al. (2010) projected that "regional species extinction will likely occur, with 99% certainty, in or before 2026...eliminating at least the core northeastern range of the species, which clearly constitutes a significant portion of the species' range in terms of population numbers, geographical distribution, resiliency, and habitat composition." Source: Kunz and Reichard (2010).

More recently, Langwig et al. (2012) reported that (as of 2010) sampled populations in New York, Vermont, Connecticut, and Massachusetts had stabilized at about 2-20 percent of the pre-WNS population size. Population stabilization apparently was facilitated by increases in the number and fraction of little brown myotis roosting individually after populations declined, which likely resulted in each bat having fewer neighbours during hibernation and lower pathogen exposure.

Long-term Trend: Decline of 50-80%

Other NatureServe Conservation Status Information

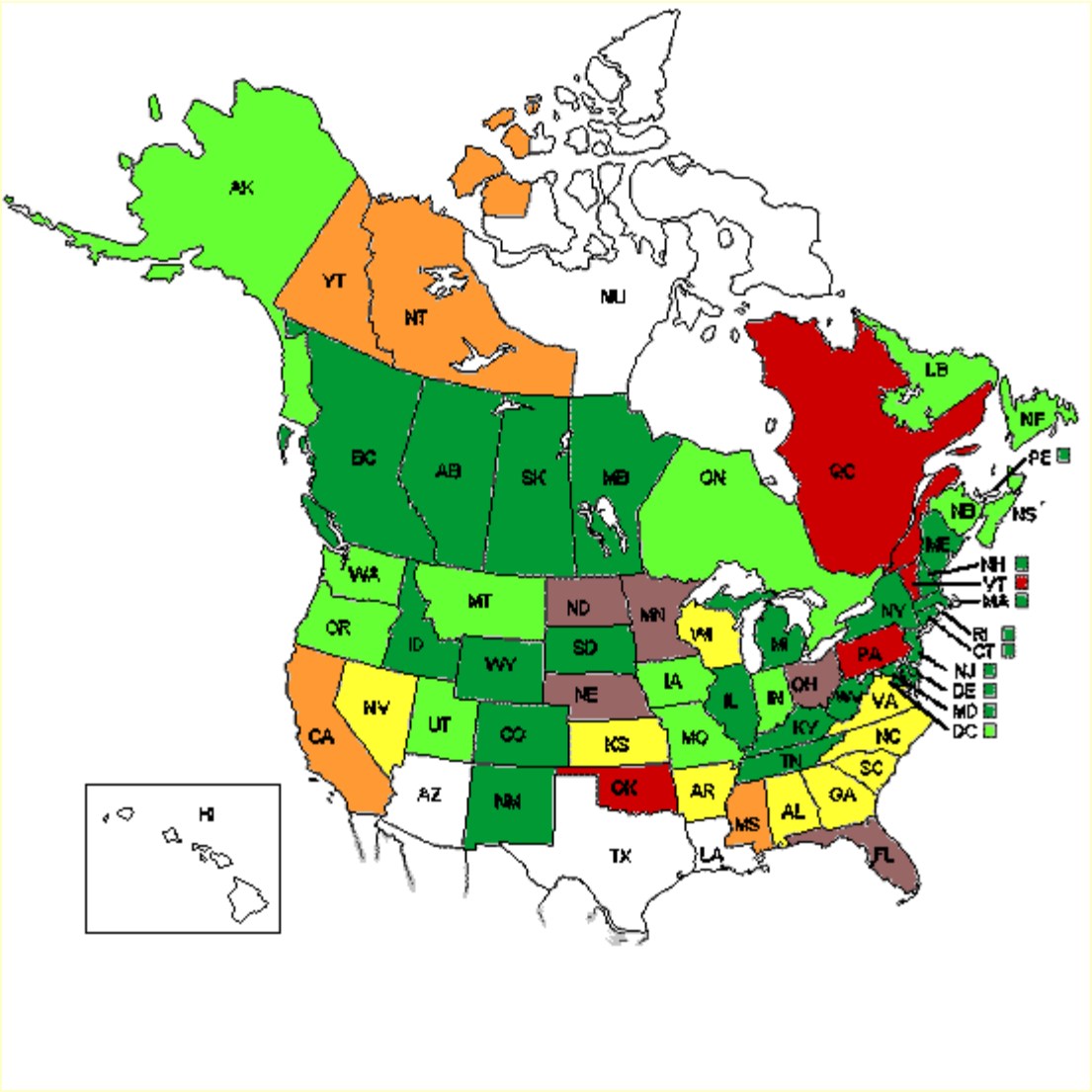
Distribution

Collapse

Global Range: (>2,500,000 square km (greater than 1,000,000 square miles)) Wide range includes North America from the Alaska-Canada boreal forest south through most of the contiguous United States, though the species is generally absent fom the southern Great Plains region. Southwestern populations formerly assigned to this species have now been assigned to *M. occultus* (Piaggio et al. 2002; Wilson and Reeder 2005), so the southwestern boundary of the range includes southern California (except extreme southeast), Nevada, northern Utah, northern Colorado, and perhaps northeastern New Mexico (Piaggio et al. 2002; Valdez, pers. comm.).

The high density of caves in the Appalachian Mountain range and eastern Midwest (Culver et al. 1999) likely "support much larger populations of this species than in other parts in the species' range. The largest known colonies of little brown myotis are in the northeastern and mid-western United States, with the northeastern population considered the core range of the species" Kunz and Reichard 2010). Smaller populations occur in the southern and western United States (Davis et al. 1965).

U.S. States and Canadian Provinces

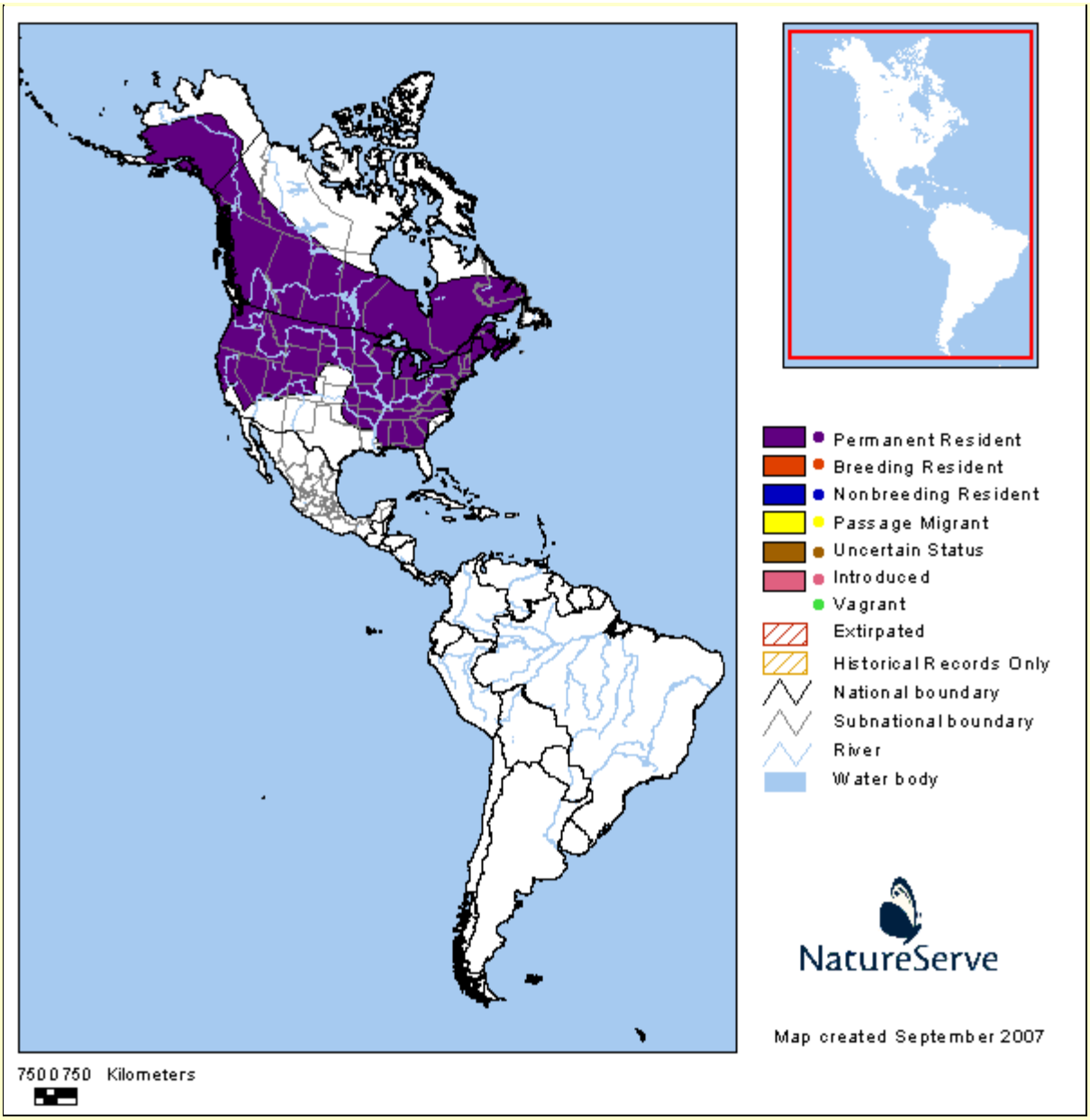


Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	AK, AL, AR, CA, CO, CT, DC, DE, FL, GA, IA, ID, IL, IN, KS, KY, MA, MD, ME, MI, MN, MO, MS, MT, NC, ND, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, RI, SC, SD, TN, UT, VA, VT, WA, WI, WV, WY
Canada	AB, BC, LB, MB, NB, NF, NS, NT, ON, PE, QC, SK, YT

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: NatureServe, 2005; Sechrest, 2002

U.S. Distribution by County	
State	**County Name (FIPS Code)**
AK	Anchorage (02020), Bethel (CA) (02050), Bristol Bay (02060), Dillingham (CA) (02070), Fairbanks North Star (02090), Haines (02100), Juneau (02110), Kenai Peninsula (02122), Ketchikan Gateway (02130), Kodiak Island (02150), Lake and Peninsula (02164), Matanuska-Susitna (02170), Nome (CA) (02180), Northwest Arctic (02188)*, Prince of Wales-Outer Ketchikan (CA) (02201), Sitka (02220), Skagway-Hoonah-Angoon (CA) (02232), Southeast Fairbanks (CA) (02240), Valdez-Cordova (CA) (02261), Wrangell-Petersburg (CA) (02280), Yakutat (02282), Yukon-Koyukuk (CA) (02290)
AL	Conecuh (01035)*
IA	Lucas (19117), Madison (19121), Marion (19125)
ID	Ada (16001), Adams (16003), Bannock (16005), Bear Lake (16007), Bingham (16011), Blaine (16013), Boise (16015), Bonner (16017), Bonneville (16019), Boundary (16021), Butte (16023), Caribou (16029), Cassia (16031), Clark (16033), Clearwater (16035), Custer (16037), Franklin (16041), Fremont (16043), Gooding (16047), Idaho (16049), Kootenai (16055), Latah (16057)*, Lemhi (16059), Lincoln (16063), Nez Perce (16069), Owyhee (16073), Payette (16075), Power (16077), Shoshone (16079), Teton (16081), Twin Falls (16083), Valley (16085)

IN	Bartholomew (18005), Crawford (18025), Daviess (18027), Dubois (18037), Gibson (18051), Greene (18055), Harrison (18061), Johnson (18081), Knox (18083), La Porte (18091), Lawrence (18093), Marion (18097), Martin (18101), Monroe (18105), Morgan (18109), Orange (18117), Porter (18127), Vigo (18167), Warren (18171), Washington (18175)
MS	Jackson (28059)*, Panola (28107)*, Wayne (28153)
NV	Elko (32007), Humboldt (32013)*, Washoe (32031)*, White Pine (32033)
OK	Adair (40001), Cimarron (40025)*, McCurtain (40089)*
SC	Beaufort (45013), Greenville (45045), Oconee (45073), Pickens (45077)
VT	Addison (50001), Bennington (50003), Chittenden (50007), Lamoille (50015), Orange (50017), Rutland (50021), Washington (50023), Windham (50025), Windsor (50027)
WA	Chelan (53007)+*, Columbia (53013)+*, Douglas (53017)+*, Garfield (53023)+*, Grant (53025)+*, Grays Harbor (53027)+*, King (53033)+*, Kittitas (53037)+*, Lincoln (53043)+*, Mason (53045)+*, Okanogan (53047)+*, Pierce (53053)+*, Skagit (53057)+*, Thurston (53067)+*, Wahkiakum (53069)+*, Whatcom (53073)+*, Whitman (53075)+*, Yakima (53077)+*
WI	Bayfield (55007), Burnett (55013), Calumet (55015), Chippewa (55017), Crawford (55023), Dane (55025), Dodge (55027), Door (55029), Douglas (55031), Dunn (55033), Grant (55043), Green (55045), Green Lake (55047), Iowa (55049), Iron (55051), Jackson (55053), La Crosse (55063), Lafayette (55065), Lincoln (55069), Manitowoc (55071), Marinette (55075), Marquette (55077), Monroe (55081), Oneida (55085), Outagamie (55087), Ozaukee (55089), Pierce (55093), Polk (55095), Richland (55103), Sauk (55111), Sawyer (55113), Shawano (55115), St. Croix (55109), Taylor (55119), Trempealeau (55121), Vernon (55123), Vilas (55125), Washburn (55129), Waukesha (55133), Waupaca (55135)
WY	Crook (56011), Platte (56031), Weston (56045)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed

Watershed Region	Watershed Name (Watershed Code)
01	Upper Connecticut-Mascoma (01080104)+, White (01080105)+, Black-Ottauquechee (01080106)+, Deerfield (01080203)+
02	Hudson-Hoosic (02020003)+
03	Saluda (03050109)+, Salkehatchie (03050207)+, Broad-St. Helena (03050208)+, Seneca (03060101)+, Tugaloo (03060102)+, Sepulga (03140303)+*, Upper Chickasawhay (03170002)+, Mississippi Coastal (03170009)+*
04	Beartrap-Nemadji (04010301)+, Bad-Montreal (04010302)+, Manitowoc-Sheboygan (04030101)+, Door-Kewaunee (04030102)+, Peshtigo (04030105)+, Upper Fox (04030201)+, Wolf (04030202)+, Little Calumet-Galien (04040001)+, Milwaukee (04040003)+, Mettawee River (04150401)+, Otter Creek (04150402)+, Winooski River (04150403)+, Lamoille River (04150405)+, Lake Champlain (04150408)+
05	Middle Wabash-Little Vermilion (05120108)+, Middle Wabash-Busseron (05120111)+, Upper White (05120201)+, Lower White (05120202)+, Driftwood (05120204)+, Lower East Fork White (05120208)+, Patoka (05120209)+, Blue-Sinking (05140104)+, Highland-Pigeon (05140202)+
07	Upper St. Croix (07030001)+, Namekagon (07030002)+, Lower St. Croix (07030005)+, Rush-Vermillion (07040001)+, Buffalo-Whitewater (07040003)+, La Crosse-Pine (07040006)+, Black (07040007)+, Upper Chippewa (07050001)+, Flambeau (07050002)+, Lower Chippewa (07050005)+, Red Cedar (07050007)+, Coon-Yellow (07060001)+, Grant-Little Maquoketa (07060003)+, Apple-Plum (07060005)+, Upper Wisconsin (07070001)+, Castle Rock (07070003)+, Baraboo (07070004)+, Lower Wisconsin (07070005)+, Kickapoo (07070006)+, South Skunk (07080105)+, Upper Rock (07090001)+, Crawfish (07090002)+, Pecatonica (07090003)+, Lake Red Rock (07100008)+, Lower Des Moines (07100009)+, Upper Fox (07120006)+
10	Beaver (10120107)+, Redwater (10120203)+, Glendo Reservoir (10180008)+, Upper Chariton (10280201)+
11	Upper Cimarron (11040002)+*, Robert S. Kerr Reservoir (11110104)+, Mountain Fork (11140108)+*

16	Bear Lake (16010201)+, Middle Bear (16010202)+, Upper Humboldt (16040101)+, North Fork Humboldt (16040102)+, South Fork Humboldt (16040103)+*, Smoke Creek Desert (16040203)+*, Lake Tahoe (16050101)+*, Truckee (16050102)+*, Long-Ruby Valleys (16060007)+, Spring-Steptoe Valleys (16060008)+
17	Lower Kootenai (17010104)+, Moyie (17010105)+, Lower Clark Fork (17010213)+, Pend Oreille Lake (17010214)+, Priest (17010215)+, Upper Coeur D'alene (17010301)+, South Fork Coeur D'alene (17010302)+, Coeur D'alene Lake (17010303)+, St. Joe (17010304)+, Upper Spokane (17010305)+*, Similkameen (17020007)*, Methow (17020008)*, Lake Chelan (17020009)*, Upper Columbia-Entiat (17020010)*, Wenatchee (17020011)*, Moses Coulee (17020012)*, Upper Crab (17020013)*, Banks Lake (17020014)*, Upper Yakima (17030001)*, Naches (17030002)*, Palisades (17040104)+, Salt (17040105)+, Idaho Falls (17040201)+, Upper Henrys (17040202)+, Teton (17040204)+, Willow (17040205)+, American Falls (17040206)+, Blackfoot (17040207)+, Portneuf (17040208)+, Lake Walcott (17040209)+, Raft (17040210)+, Upper Snake-Rock (17040212)+, Salmon Falls (17040213)+, Beaver-Camas (17040214)+, Medicine Lodge (17040215)+, Birch (17040216)+, Big Lost (17040218)+, Big Wood (17040219)+, Bruneau (17050102)+, Middle Snake-Succor (17050103)+, Upper Owyhee (17050104)+, South Fork Owyhee (17050105)+, Middle Owyhee (17050107)+, Boise-Mores (17050112)+, Lower Boise (17050114)+, Payette (17050122)+, North Fork Payette (17050123)+, Brownlee Reservoir (17050201)+, Lower Snake-Asotin (17060103)+, Lower Snake-Tucannon (17060107)*, Palouse (17060108)+*, Rock (17060109)*, Upper Salmon (17060201)+, Middle Salmon-Panther (17060203)+, Lemhi (17060204)+, Lower Middle Fork Salmon (17060206)+, Lower Salmon (17060209)+, Little Salmon (17060210)+, Lower Selway (17060302)+, Lochsa (17060303)+, South Fork Clearwater (17060305)+, Clearwater (17060306)+, Upper North Fork Clearwater (17060307)+, Lower Columbia (17080006)*, Lower Chehalis (17100104)*, Nooksack (17110004)*, Upper Skagit (17110005)*, Snoqualmie (17110010)*, Puyallup (17110014)*, Nisqually (17110015)*, Deschutes (17110016)*, Skokomish (17110017)*, Puget Sound (17110019)*
19	Southeast Mainland (19010101)+, Ketchikan (19010102)+, Prince of Wales (19010103)+, Mainland (19010201)+, Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell Isla (19010202)+, Baranof-Chichagof Islands (19010203)+, Admiralty Island (19010204)+, Lynn Canal (19010301)+, Glacier Bay (19010302)+, Chilkat-Skagway Rivers (19010303)+, Yakutat Bay (19010401)+, Middle Copper River (19020102)+, Chitina River (19020103)+, Lower Copper River (19020104)+, Eastern Prince William Sound (19020201)+, Western Prince William Sound (19020202)+, Lower Kenai Peninsula (19020301)+, Upper Kenai Peninsula (19020302)+, Anchorage (19020401)+, Matansuka (19020402)+, Talkeetna River (19020503)+, Yentna River (19020504)+, Lower Susitna River (19020505)+, Tuxdeni-Kamishak Bays (19020602)+, Kodiak-Afognak Islands (19020701)+, Cook Inlet (19020800)+, Naknek (19030204)+, Lake Clark (19030205)+, Lake Iliamna (19030206)+, Lower Nushagak River (19030303)+, Wood River (19030304)+, Nushagak Bay (19030306)+*, Stony River (19030405)+, Middle Fork Kuskokwim River (19030406)+, Aniak (19030501)+, Kuskokwim Delta (19030502)+, Fortymile River (19040104)+, Birch-Beaver Creeks (19040402)+, Yukon Flats (19040403)+, Ramparts (19040404)+, Nebesna-Chisana Rivers (19040501)+, Tok (19040502)+, Healy Lake (19040503)+, Delta River (19040504)+, Chena River (19040506)+, Tanana River (19040507)+, Tolovana River (19040509)+, Lower Tanana River (19040511)+, Unalakleet (19050102)+, Nome (19050104)+, Lower Noatak River (19050403)+*

\+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: A small brown bat.
General Description: Cinnamon-buff to dark brown above, buffy to pale gray below; hairs on back have long glossy tips; ear when laid forward reaches approximately the nostril; tragus about half as high as ear; calcar without keel; length of head and body 41-54 mm, ear 11.0-15.5 mm, forearm 33-41 mm; braincase rises gradually from rostrum; greatest length of skull 14-16 mm; length of upper toothrow 5.0-6.6 mm (Hall 1981).
Diagnostic Characteristics: Differs from *M. sodalis* in unkeeled calcar. Differs from *M. austroriparius* in smaller size, glossy rather than dull pelage, and usual absence of a sagittal crest. Differs from *M. grisescens* in banded dorsal hairs banded (vs. unicolored) and wing attached to the foot at the base of the toe rather than at the ankle. Differs from *M. velifer* in smaller size, glossy rather than dull pelage, and lack of sagittal crest. Differs from *M. keenii* and *M. septentrionalis* in shorter ears that do not extend beyond the nose when laid forward. Differs from *M. volans* in smaller size, glossy rather than dull pelage, and unkeeled calcar. Differs from *M. yumanensis* in larger size, larger skull (greatest length usually more than 14 mm rather than

usually less than 14 mm), and usually glossy pelage rather than dull pelage. Differs from *M. thysanodes* in absence of a conspicuous fringe of hairs along the edge of the interfemoral membrane. Differs from *M. californicus* in larger size, unkeeled calcar, and skull rising gradually from rostrum. Differs from *M. leibii* in larger size and unkeeled calcar. (Hall 1981).
Reproduction Comments: Usually mates in September-October. Ovulation and fertilization are delayed until spring. Gestation lasts 50-60 days. Gives birth to 1 litter of 1 young, late spring-early summer. Females produce first young usually in first (Indiana, New Mexico) or second year (British Columbia) (Herd and Fenton 1983). In British Columbia, may delay or forego reproduction in wet years (Grindal et al. 1992). Survival for a decade may be fairly common; a few live as long as 20-30 years; females may be reproductive to an age of at least 12 years (Hall et al. 1957, Keen and Hitchcock 1980). Most summer colonies range from 50 to 2500 individuals (average 400) (Mumford and Cope 1964).
Ecology Comments: Winter concentrations may include tens of thousands. Summer home range is poorly understood. Experiences low survival during first winter, higher in subsequent years.
Non-Migrant: N
Locally Migrant: Y
Long Distance Migrant: Y
Mobility and Migration Comments: In the northeast, may migrate hundreds of miles between winter and summer habitats; in the west, believed to hibernate near their summer range (Schmidly 1991).
Palustrine Habitat(s): Bog/fen, FORESTED WETLAND, HERBACEOUS WETLAND, Riparian
Terrestrial Habitat(s): Forest - Hardwood, Forest - Mixed, Grassland/herbaceous, Old field, Shrubland/chaparral, Suburban/orchard, Urban/edificarian, Woodland - Hardwood, Woodland - Mixed
Subterranean Habitat(s): Subterrestrial
Special Habitat Factors: Standing snag/hollow tree
Habitat Comments: These bats use a wide range iof habitats and often use human-made structures for resting and maternity sites; they also use caves and hollow trees. Foraging habitat requirements are generalized; foraging usually occurs in woodlands near water. Winter hibernation sites (caves, tunnels, abandoned mines, and similar sites) generally have a relatively stable temperature of about 2-12 C (see Kunz and Reichard 2010). Maternity colonies commonly are in warm sites in buildings (e.g., attics) and other structures; also infrequently in hollow trees. Miicroclimate conditions suitable for raising young are relatively narrow, and availability of suitable maternity sites may limit the species' abundance and distribution.
Adult Food Habits: Invertivore
Immature Food Habits: Invertivore
Food Comments: Often hunts over water or along the margins of lakes and streams; consumes flying insects, especially mosquitoes, midges, caddisflies, moths, various hoppers, and smaller beetles, sometimes spiders (e.g., see Whitaker and Lawhead 1992). Insects with wingspans of 1/8-1/2" are pursued (Schwartz and Schwartz 1981). Prey are detected by echolocation at a range of 1 m (Fenton and Bell 1979).
Adult Phenology: Hibernates/aestivates, Nocturnal
Immature Phenology: Hibernates/aestivates, Nocturnal
Phenology Comments: Most active during the first 2-3 hours after sunset. Following a mid-night roost is a second foraging period. Cool temperatures and a low abundance of prey will lengthen the mid-night roost. Hibernates September-October to April-May. In Indiana, a few bats flew outside a hibernation site periodically throughout the winter, especially in mild weather; feeding apparently did not begin until mid-March (Whitaker and Rissler 1992).
Colonial Breeder: Y
Length: 9 centimeters
Weight: 14 grams

Economic Attributes — Not yet assessed
Management Summary — Expand
Population/Occurrence Delineation — Expand
Population/Occurrence Viability — Expand
U.S. Invasive Species Impact Rank (I-Rank) — Not yet assessed
Authors/Contributors — Expand
References — Expand

Use Guidelines & Citation

Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Myotis septentrionalis - (Trovessart, 1897)

Northern Myotis

Other English Common Names: Northern Bat, Northern Long-eared Bat, Northern Long-eared Myotis
Synonym(s): *Myotis keenii septentrionalis* (Trouessart, 1897)
Taxonomic Status: Accepted
French Common Names: chauve-souris nordique, vespertilion nordique
Unique Identifier: ELEMENT_GLOBAL.2.102615
Element Code: AMACC01150
Informal Taxonomy: Animals, Vertebrates - Mammals - Bats

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Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Mammalia	Chiroptera	Vespertilionidae	Myotis

Genus Size: D - Medium to large genus (21+ species)

Check this box to expand all report sections: ☐

Concept Reference

Expand

Conservation Status

Collapse

NatureServe Status

Global Status: G2G3
Global Status Last Reviewed: 18Apr2013
Global Status Last Changed: 18Apr2013
Ranking Methodology Used: Ranked by calculator
Rounded Global Status: G2 - Imperiled
Reasons: Large range in the eastern and north-central United States and much of southern Canada; most abundant in the northern part of the range but relatively rare rangewide both in terms of hibernacula and in summer foraging and maternity areas; frequently comprises less than 10% of the bat community. Significant recent declines associated with rapidly spreading white-nose syndrome have occurred in eastern North America, and some habitat has been lost, degraded, or fragmented, primarily through the disturbance of hibernacula and land development. Mortality caused by wind turbines is expected to increase.
Nation: United States
National Status: N2N3 (18Apr2013)
Nation: Canada
National Status: N2N3 (18Sep2012)

U.S. & Canada State/Province Status	
United States	Alabama (S2), Arkansas (S4), Connecticut (SU), Delaware (SU), District of Columbia (S4), Florida (SH), Georgia (S3S4), Illinois (S4), Indiana (S3), Iowa (S4), Kansas (S2), Kentucky (S4), Louisiana (SNR), Maine (S4), Maryland (S4B,S4N), Massachusetts (S4), Michigan (SNR), Minnesota (S3), Mississippi (S3?B,S3?N), Missouri (S4), Nebraska (SNR), New Hampshire (S3), New Jersey (SU), New York (S3S4), North Carolina (S3), North Dakota (SU), Ohio (SNR), Oklahoma (S2), Pennsylvania (S1), Rhode Island (S2), South Carolina (S4), South Dakota (S3), Tennessee (S4), Vermont (S1), Virginia (S3), West Virginia (S3S4), Wisconsin (S1S3), Wyoming (S1B,S1N)
Canada	Alberta (S2S3), British Columbia (S2S3), Labrador (SNR), Manitoba (S3S4N,S4B), New Brunswick (S4), Newfoundland Island (S2S3), Northwest Territories (S2), Nova Scotia (S2), Ontario (S3), Prince Edward Island (S1S2), Quebec (S1), Saskatchewan (S4B,SNRN), Yukon Territory (S1S2)

Other Statuses

U.S. Endangered Species Act (USESA): PE: Proposed endangered (02Oct2013)
Comments on USESA: In a 12-month petition finding, USFWS (2013) found that listing the northern long-eared bat is warranted and propose to list it as an endangered species throughout its range.
Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Endangered (01Nov2013)
Comments on COSEWIC: Approximately 40% of the global range of this northern bat is in Canada. Sub-populations in the eastern part of the range have been devastated by White-nose Syndrome, a fungal disease caused by an introduced pathogen. This disease was first detected in Canada in 2010 and to date has caused a 94% overall decline in numbers of known hibernating Myotis bats in Nova Scotia, New Brunswick, Ontario, and Quebec hibernacula compared with earlier counts before the disease struck. Models in the northeastern United States for Little Brown Myotis predict a 99% probability of functional extinction within 13 years. Given similar life history characteristics, these results are likely applicable to this species. In addition to its tendency to occur in relatively low abundance levels in hibernacula, there is some indication this species is experiencing greater declines than other species since the onset of White-nose Syndrome. The current range of White-nose Syndrome overlaps with approximately one third of this species' range and is expanding at an average rate of 200 to 250 kilometres per year. At that rate, the entire Canadian population will likely be affected within 12 to18 years. There is no apparent containment of the northward or westward spread of the pathogen, and proper growing conditions for it exist throughout the remaining range.

Designated Endangered in an emergency assessment on February 3, 2012. Status re-examined and confirmed in November 2013.
IUCN Red List Category: LC - Least concern

NatureServe Global Conservation Status Factors

Range Extent: >2,500,000 square km (greater than 1,000,000 square miles)
Range Extent Comments: This bat is widely but patchily distributed in the eastern and northcentral United States and adjacent southern Canada, from Newfoundland and eastern Quebec south through New England and the mountains of Virginia, North Carolina, South Carolina, and Georgia to the northcentral panhandle of Florida (formerly) and northwestward through Alabama, northern Arkansas, the eastern Great Plains, and the western Canadian provinces, to northeastern British Columbia and southern Northwest Territories (Barbour and Davis 1969, Harvey 1992, van Zyll de Jong 1985, Hall 1981). Three individuals, including a lactating female, were recently recorded in Louisiana (Crnkovic 2003). The general summer and winter ranges appear to be identical (Barbour and Davis 1969). This species is more common in the northern part of the range than in the south (Harvey 1992), and it is rare in the northwestern portion of the range (Nagorsen and Brigham 1993, Caceres and Barclay 2000). It is reported as very rare in Alabama (Best, pers. comm.), uncommon in Indiana, Kentucky, Tennessee, and Wisconsin (Mumford and Cope 1964, Harvey 1991, Jackson 1961), more common in northern Michigan than in southern Michigan (Kurta 1982), and quite common in New York (Hamilton and Whitaker 1979).

Number of Occurrences: 81 - 300
Number of Occurrences Comments: This species is represented by a large number of occurrences (subpopulations). Among five states providing information, some 77 element occurrences (EOs) of all types combined (hibernation, maternity, foraging) are known. With its widespread range, including former mining regions, there certainly are more than 100 EOs. EOs only of the

most limiting type (probably hibernating colonies) should be considered when calculating number of EOs.

Population Size: 10,000 - 1,000,000 individuals
Population Size Comments: Although there are probably over 100 hibernating colonies rangewide, these colonies only rarely comprise even as many as 50 bats, suggesting that populations may be quite small. It thus is possible that the total rangewide population is less than 10,000 bats (with a colony average of 50 bats it would take 200 occurrences to account for a total population of 10,000 bats).

Overall Threat Impact: High
Overall Threat Impact Comments: The most serious threat is white-nose syndrome (WNS), an often (but not always) lethal condition caused by a fungal pathogen (*Geomyces destructans*). WNS was first noticed in 2006 in New York. Since its initial discovery, WNS has spread rapidly and now occurs throughout most of the northeastern United States and adjacent southeastern Canada. WNS affects *Myotis septentrionalis* and several other bat species (Gargas et al. 2009) and resulted in more than a million bat deaths in the northeastern United States in just 5 years. Though *M. septentrionalis* was not common in surveys in the northeastern United States before the recognition of WNS, counts of this species subsequently have declined to zero in many caves since the advent of the disease (Hicks et al. 2008). As of mid-2012, WNS was still spreading but was confined almost exclusively to areas east of the Mississippi River (plus a few locations in Missouri and Oklahoma).

Loss, degradation, and fragmentation of mature forest habitat (associated with various kinds of human activities, such as logging; oil, gas, and mineral development; and wind energy development) also may be a significant threat (Center for Biological Diversity 2010, USFWS 2011). Mortality caused directly by wind turbines may pose a significant threat in some areas (USFWS 2011).

Closures of mines used for hibernation are a potential threat, but there is no evidence that mine closures are currently affecting *Myotis septentrionalis* populations (USFWS 2011).

This species is sensitive to disturbance during hibernation (Garner, pers. comm., Thomas 1995); frequently aroused bats may deplete their energy reserves. Nursery colonies are very sensitive to disturbance by humans; bats may move to an alternate roost after a single examination, even if no attempt is made to capture the bats (Layne 1978).

Short-term Trend: Decline of 50 to >90%
Short-term Trend Comments: Abundance likely has declined over the past three generations (perhaps 30 years). Populations of this species in New York, Massachusetts, and Vermont declined 93 pecent overall in the few years since white-nose syndrome was first discovered (Langwig et al. 2009).

Long-term Trend: Unknown
Long-term Trend Comments: Prior to incidence of white-nose syndrome: Adequate data to assess trends were not available, but anecdotal observations did not indicate any obvious declines. There were no published reports of declines in this species, and population data that did exist were too spatially and temporally scattered to reveal a trend.

Other NatureServe Conservation Status Information

Inventory Needs: Very little research has been directed at this species, and most references are anecdotal accounts of incidental collections. A concentrated effort to survey mines and caves across its range over the next five years would provide a much better picture of its range-wide status, as well as that of a number of other cave and mine-dwelling bats that are known or suspected to be declining. In states where declines or threats and/or impacts are apparent, populations should be monitored every year or two, depending upon pattern of decline or impacts.

Protection Needs: Threatened primarily in the southeastern USA, and in this region better legal protection is needed. Collecting should be limited to approved scientific purposes. More gating of caves and mines throughout the range (rather than closing mines) would benefit this species as well as a number of other rare bats. Protection of hibernacula and maternity roosts from disturbances is of highest priority. Protection of foraging habitat, if disjunct from summer roosts and maternity colonies, may be most effectively gained through private or public landowner cooperation. In caves and mines, hydrological considerations are important. Seasonal flooding may make some caves unsuitable in some years and reduction in ground water flow could alter cave humidity. Thus, alternate sites are needed for periods with unusual climatic conditions. Throughout

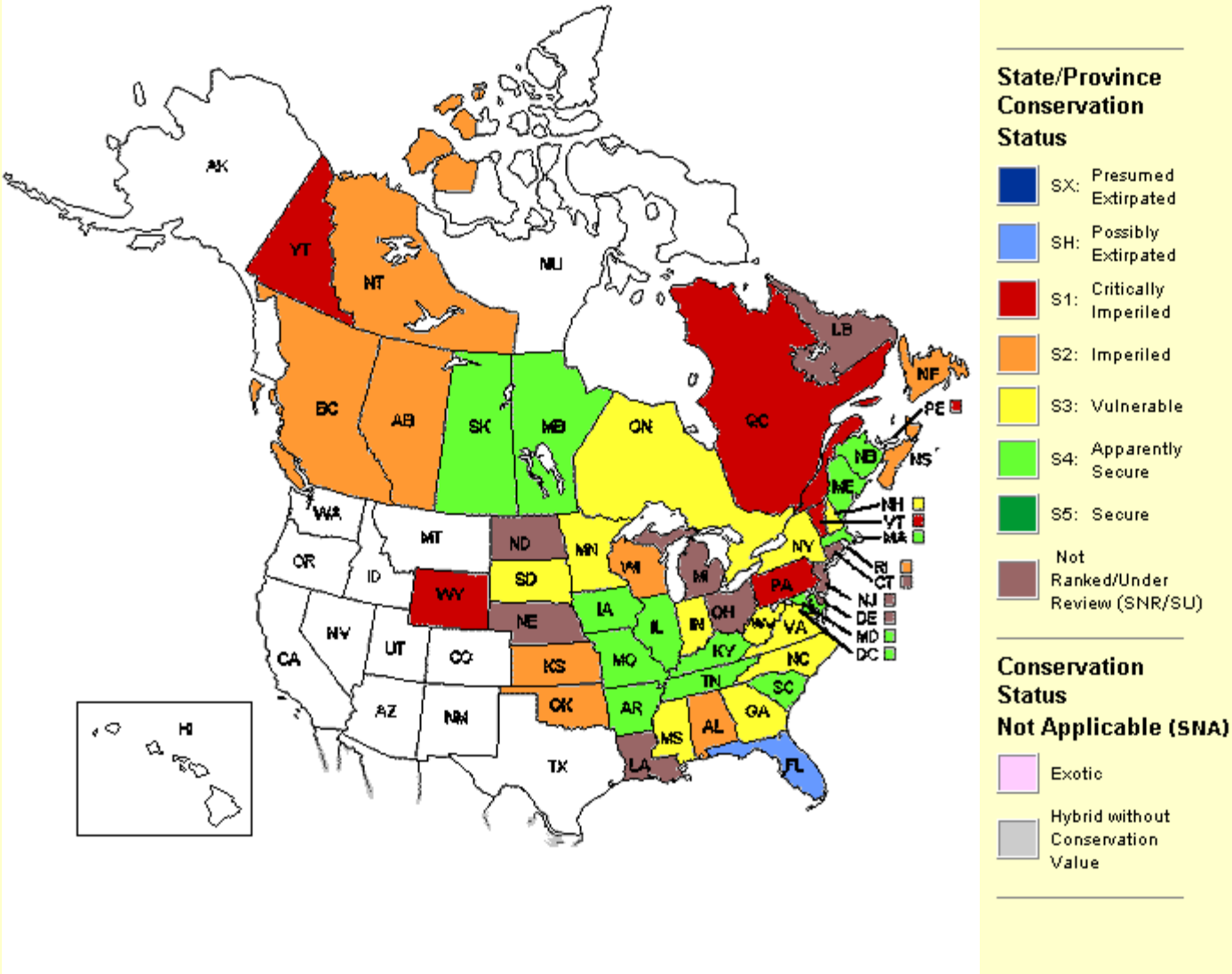
the range, protection of winter hibernacula from human visitors should be considered a high priority. The invasiveness and long-term impact of monitoring activities should be minimized. See also ES record.

Distribution

Collapse

Global Range: (>2,500,000 square km (greater than 1,000,000 square miles)) This bat is widely but patchily distributed in the eastern and northcentral United States and adjacent southern Canada, from Newfoundland and eastern Quebec south through New England and the mountains of Virginia, North Carolina, South Carolina, and Georgia to the northcentral panhandle of Florida (formerly) and northwestward through Alabama, northern Arkansas, the eastern Great Plains, and the western Canadian provinces, to northeastern British Columbia and southern Northwest Territories (Barbour and Davis 1969, Harvey 1992, van Zyll de Jong 1985, Hall 1981). Three individuals, including a lactating female, were recently recorded in Louisiana (Crnkovic 2003). The general summer and winter ranges appear to be identical (Barbour and Davis 1969). This species is more common in the northern part of the range than in the south (Harvey 1992), and it is rare in the northwestern portion of the range (Nagorsen and Brigham 1993, Caceres and Barclay 2000). It is reported as very rare in Alabama (Best, pers. comm.), uncommon in Indiana, Kentucky, Tennessee, and Wisconsin (Mumford and Cope 1964, Harvey 1991, Jackson 1961), more common in northern Michigan than in southern Michigan (Kurta 1982), and quite common in New York (Hamilton and Whitaker 1979).

U.S. States and Canadian Provinces



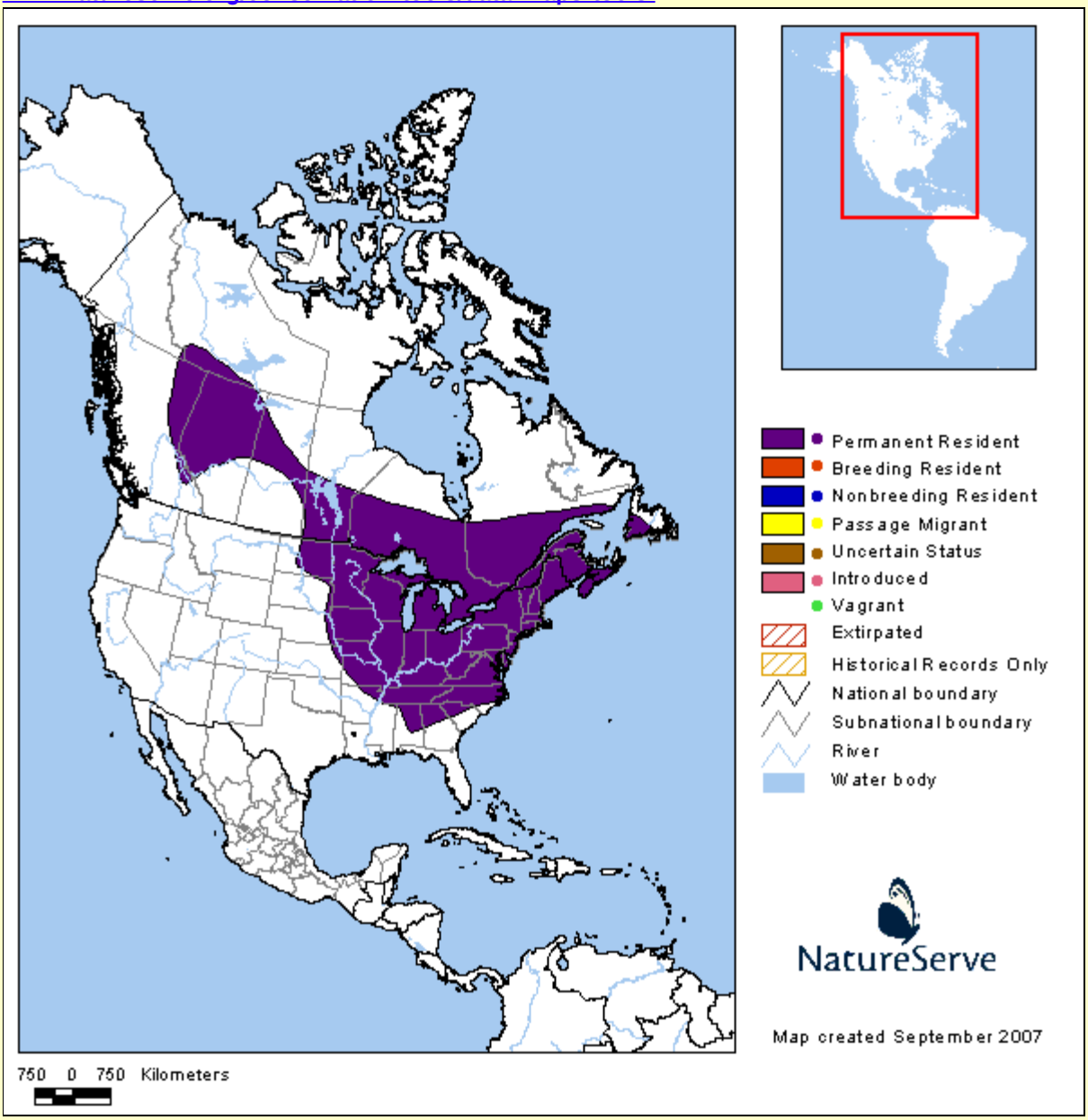
Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United	AL, AR, CT, DC, DE, FL, GA, IA, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, NC, ND, NE, NH, NJ, NY,

States	OH, OK, PA, RI, SC, SD, TN, VA, VT, WI, WV, WY
Canada	AB, BC, LB, MB, NB, NF, NS, NT, ON, PE, QC, SK, YT

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: NatureServe, 2005; Sechrest, 2002

U.S. Distribution by County	
State	**County Name (FIPS Code)**
AL	Franklin (01059), Lawrence (01079)
CT	Litchfield (09005)
FL	Jackson (12063)*
IA	Allamakee (19005), Appanoose (19007), Black Hawk (19013), Boone (19015), Decatur (19053), Delaware (19055), Dubuque (19061), Fremont (19071), Hardin (19083), Jones (19105), Lucas (19117),

	Madison (19121), Marion (19125), Marshall (19127), Monroe (19135), Plymouth (19149), Ringgold (19159), Scott (19163)*, Tama (19171), Webster (19187), Woodbury (19193)
IN	Bartholomew (18005), Benton (18007), Brown (18013), Crawford (18025), Daviess (18027), Gibson (18051), Greene (18055), Johnson (18081), Knox (18083), La Porte (18091), Lawrence (18093), Marion (18097), Martin (18101), Monroe (18105), Morgan (18109), Newton (18111), Pike (18125), Porter (18127), Randolph (18135), Tippecanoe (18157), Vigo (18167), Warren (18171)
KS	Ellis (20051)*, Graham (20065), Marshall (20117)*, Norton (20137), Osborne (20141), Phillips (20147), Rooks (20163), Russell (20167)
MN	Carlton (27017), Cook (27031), Fillmore (27045), Goodhue (27049), Lake (27075), Nicollet (27103)*, Pine (27115), Ramsey (27123), Sherburne (27141)*, St. Louis (27137), Stearns (27145)*, Wabasha (27157), Washington (27163)
MO	Barry (29009), Boone (29019), Butler (29023), Carter (29035), Crawford (29055), Dent (29065), Douglas (29067), Franklin (29071), Grundy (29079), Howell (29091), Iron (29093), Laclede (29105), Lewis (29111), Linn (29115), Madison (29123), Oregon (29149), Ozark (29153), Phelps (29161), Pulaski (29169), Reynolds (29179), Shannon (29203), Ste. Genevieve (29186), Taney (29213), Texas (29215), Washington (29221), Wayne (29223), Wright (29229)
MS	Tishomingo (28141)
NC	Buncombe (37021)*, Swain (37173)*
NE	Brown (31017), Cherry (31031), Dakota (31043), Dixon (31051), Franklin (31061), Holt (31089), Jefferson (31095), Pawnee (31133), Thurston (31173)
NH	Carroll (33003), Cheshire (33005), Coos (33007), Grafton (33009), Hillsborough (33011), Rockingham (33015), Sullivan (33019)
OK	Adair (40001), Choctaw (40023), LeFlore (40079), McCurtain (40089), Pushmataha (40127)
PA	Adams (42001), Allegheny (42003), Armstrong (42005), Bedford (42009), Berks (42011), Blair (42013), Bradford (42015), Bucks (42017), Cambria (42021), Cameron (42023), Carbon (42025), Centre (42027), Chester (42029), Clarion (42031), Clearfield (42033), Clinton (42035), Columbia (42037), Cumberland (42041), Dauphin (42043), Elk (42047), Fayette (42051), Forest (42053), Franklin (42055), Fulton (42057), Greene (42059), Huntingdon (42061), Indiana (42063), Juniata (42067), Lackawanna (42069), Lancaster (42071), Lawrence (42073), Lebanon (42075), Lehigh (42077), Luzerne (42079), Lycoming (42081), McKean (42083), Mercer (42085), Mifflin (42087), Monroe (42089), Montgomery (42091), Northampton (42095), Northumberland (42097), Pike (42103), Schuylkill (42107), Snyder (42109), Somerset (42111), Tioga (42117), Union (42119), Venango (42121), Warren (42123), Washington (42125), Westmoreland (42129), York (42133)
SC	Greenville (45045), Oconee (45073), Pickens (45077)
SD	Bon Homme (46009), Brule (46015), Charles Mix (46023), Clay (46027), Custer (46033), Gregory (46053), Hughes (46065), Jackson (46071), Lawrence (46081), Lyman (46085), Meade (46093), Pennington (46103), Stanley (46117), Union (46127), Yankton (46135)
TN	Blount (47009)*
VT	Addison (50001), Bennington (50003), Chittenden (50007), Orange (50017), Rutland (50021), Washington (50023), Windham (50025), Windsor (50027)
WI	Bayfield (55007), Calumet (55015), Crawford (55023), Dane (55025), Dodge (55027), Door (55029), Dunn (55033), Florence (55037), Grant (55043), Iowa (55049), Iron (55051), La Crosse (55063), Lafayette (55065), Manitowoc (55071), Monroe (55081), Oconto (55083), Pierce (55093), Richland (55103), Sauk (55111), Vernon (55123)
WY	Crook (56011)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
01	Saco (01060002)+, Piscataqua-Salmon Falls (01060003)+, Upper Connecticut (01080101)+, Upper Connecticut-Mascoma (01080104)+, White (01080105)+, Black-Ottauquechee (01080106)+, Middle Connecticut (01080201)+, Deerfield (01080203)+, Housatonic (01100005)+
02	Hudson-Hoosic (02020003)+, Middle Delaware-Mongaup-Brodhead (02040104)+, Middle Delaware-

	Musconetcong (02040105)+, Lehigh (02040106)+, Schuylkill (02040203)+, Brandywine-Christina (02040205)+, Tioga (02050104)+, Upper Susquehanna-Tunkhannock (02050106)+, Upper Susquehanna-Lackawanna (02050107)+, Upper West Branch Susquehanna (02050201)+, Sinnemahoning (02050202)+, Middle West Branch Susquehanna (02050203)+, Bald Eagle (02050204)+, Lower West Branch Susquehanna (02050206)+, Lower Susquehanna-Penns (02050301)+, Upper Juniata (02050302)+, Raystown (02050303)+, Lower Juniata (02050304)+, Lower Susquehanna-Swatara (02050305)+, Lower Susquehanna (02050306)+, North Branch Potomac (02070002)+, Cacapon-Town (02070003)+, Conococheague-Opequon (02070004)+
03	Upper Broad (03050105)+, Saluda (03050109)+, Seneca (03060101)+, Tugaloo (03060102)+, Chipola (03130012)+*, Sipsey Fork (03160110)+
04	Baptism-Brule (04010101)+, Beaver-Lester (04010102)+, St. Louis (04010201)+, Bad-Montreal (04010302)+, Manitowoc-Sheboygan (04030101)+, Door-Kewaunee (04030102)+, Duck-Pensaukee (04030103)+, Brule (04030106)+, Little Calumet-Galien (04040001)+, Mettawee River (04150401)+, Otter Creek (04150402)+, Winooski River (04150403)+, Lake Champlain (04150408)+
05	Upper Allegheny (05010001)+, Middle Allegheny-Tionesta (05010003)+, Clarion (05010005)+, Middle Allegheny-Redbank (05010006)+, Conemaugh (05010007)+, Kiskiminetas (05010008)+, Lower Allegheny (05010009)+, Cheat (05020004)+, Lower Monongahela (05020005)+, Youghiogheny (05020006)+, Shenango (05030102)+, Mahoning (05030103)+, Beaver (05030104)+, Connoquenessing (05030105)+, Upper Ohio-Wheeling (05030106)+, Mississinewa (05120103)+, Middle Wabash-Little Vermilion (05120108)+, Middle Wabash-Busseron (05120111)+, Upper White (05120201)+, Lower White (05120202)+, Driftwood (05120204)+, Lower East Fork White (05120208)+, Patoka (05120209)+, Blue-Sinking (05140104)+
06	Upper French Broad (06010105)+, Lower Little Tennessee (06010204)+*, Pickwick Lake (06030005)+, Bear (06030006)+
07	Clearwater-Elk (07010203)+*, Twin Cities (07010206)+, Middle Minnesota (07020007)+*, Kettle (07030003)+, Lower St. Croix (07030005)+, Rush-Vermillion (07040001)+, Buffalo-Whitewater (07040003)+, La Crosse-Pine (07040006)+, Root (07040008)+, Lower Chippewa (07050005)+, Coon-Yellow (07060001)+, Grant-Little Maquoketa (07060003)+, Turkey (07060004)+, Apple-Plum (07060005)+, Maquoketa (07060006)+, Lower Wisconsin (07070005)+, Kickapoo (07070006)+, Copperas-Duck (07080101)+*, South Skunk (07080105)+, Middle Cedar (07080205)+, Upper Iowa (07080207)+, Middle Iowa (07080208)+, Upper Rock (07090001)+, Crawfish (07090002)+, Pecatonica (07090003)+, Middle Des Moines (07100004)+, Lake Red Rock (07100008)+, Lower Des Moines (07100009)+, Bear-Wyaconda (07110001)+, North Fabius (07110002)+, Kankakee (07120001)+, Cahokia-Joachim (07140101)+, Meramec (07140102)+, Big (07140104)+, Upper Mississippi-Cape Girardeau (07140105)+
08	Upper St. Francis (08020202)+
09	Vermilion (09030002)+
10	Beaver (10120107)+, Middle Cheyenne-Spring (10120109)+, Rapid (10120110)+*, Middle Cheyenne-Elk (10120111)+, Upper Belle Fourche (10120201)+, Lower Belle Fourche (10120202)+, Redwater (10120203)+, Lower Lake Oahe (10130105)+, Fort Randall Reservoir (10140101)+, Bad (10140102)+, Middle White (10140202)+, Lower White (10140204)+, Middle Niobrara (10150004)+, Lower Niobrara (10150007)+, Lewis and Clark Lake (10170101)+, Vermillion (10170102)+, Lower Big Sioux (10170203)+, Blackbird-Soldier (10230001)+, West Nishnabotna (10240002)+, Nishnabotna (10240004)+, South Fork Big Nemaha (10240007)+, Middle Republican (10250016)+, Upper Saline (10260009)+, Upper North Fork Solomon (10260011)+, Upper Little Blue (10270206)+, Lower Little Blue (10270207)+*, Thompson (10280102)+, Lower Grand (10280103)+, Upper Chariton (10280201)+, Niangua (10290110)+, Upper Gasconade (10290201)+, Big Piney (10290202)+, Lower Missouri-Moreau (10300102)+
11	Beaver Reservoir (11010001)+, James (11010002)+, Bull Shoals Lake (11010003)+, North Fork White (11010006)+, Upper Black (11010007)+, Current (11010008)+, Eleven Point (11010011)+, Illinois (11110103)+, Robert S. Kerr Reservoir (11110104)+, Poteau (11110105)+, Kiamichi (11140105)+, Mountain Fork (11140108)+, Lower Little (11140109)+

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: A small insect-eating bat.
General Description: Methods of aging individuals by morphological features are limited. Juveniles can be distinguished from adults by the incomplete ossification of the phalangeal epiphyses until late August of the year of their birth (Kunz 1971, Caire et al. 1979). After that time, all are typically classified as adults. Degree of wear of the teeth has been used to determine relative age of adults (Guthrie 1933), though Hall et al. (1957) found this to be unreliable. Examination of canine and molars of individuals known to be at least 18-19 years of age revealed very little wear.

In Missouri, prehibernation fat deposition period occurs from August to October and results in an increase in average weight of 41-45% (Caire et al. 1979). By spring, the same study found that both sexes weighed approximately what they had before the prehibernation fat deposition period.
Reproduction Comments: Copulation occurs in the late summer and early fall, during the swarming period when large numbers of bats congregate in and near certain caves (Baker 1983, Kurta 1980). Females store sperm during hibernation, though some may copulate again at spring emergence (Guthrie 1933, Racey 1982). Guthrie (1933) found a portion of the males of some species to be reproductively active in late winter and early spring. However, males emerging from hibernation in Missouri were found to be reproductively inactive (undescended testes) until late July, with the largest percentage of males becoming reproductively active in August and September (Caire et al. 1979). Females ovulate at the time of emergence and parturition occurs 50-60 days later (Baker 1983). Later parturition dates at higher latitudes are due to later emergence and therefore later ovulation (Racey 1982).

Females bear a single young, with parturition occurring in late May or early June in Missouri and Oklahoma (Caire et al 1979, Easterla 1965, Caire et al. 1989), in early to late June in Indiana (Cope and Humphrey 1972), and in late June to early July in Iowa, Illinois, Michigan, and New York (Kunz 1971, Hoffmeister 1989, Kurta 1980, Hamilton and Whitaker 1979). Post-lactating females were observed by mid-June in Missouri (Caire et al. 1979) and by mid- July to late July in Michigan and Iowa (Kurta 1980, Kunz 1971), with volant young observed at about that time in all studies. Young-of-the-year may reproduce in their first fall, but the proportion of the cohort doing so is unknown (Kurta, pers. comm.). Nursery colonies are relatively small, most often including 2-30 adults (10-90 individuals, including young, according to Layne (1978)).
Ecology Comments: Syntopic species during hibernation include MYOTIS LUCIFUGUS, PIPISTRELLUS SUBFLAVUS, and EPTESICUS FUSCUS. MYOTIS SEPTENTRIONALIS generally comprises a small percentage (for example, <1% in Missouri, 6% in Quebec-Ontario, 8% in Michigan, 10% in New England, 15% in Illinois) of the bats found hibernating in any single site (Griffin 1940, Hitchcock 1949, Pearson 1962, Caire et al. 1979, Stones 1981). Summer surveys reveal similar figures. In a netting survey of Iowa bats utilizing stream corridors for foraging, Kunz (1973) captured 64 M. SEPTENTRIONALIS over three years, out of an eight-species sample totaling 540 individuals (12%); M. SEPTENTRIONALIS was the third most abundant species, ranking far behind EPTESICUS FUSCUS (243) and LASIURUS BOREALIS (124). At Renfrew mine, Fenton (1969) found 117 M. SEPTENTRIONALIS compared to 5,712 M. LUCIFUGUS.

Rarely are there more than 100 individuals per hibernation colony (Barbour and Davis 1969, Caire et al. 1979). However, Stones (1981), found over 100 individuals (mean = 226) in 5 of 21 mines in which M. SEPTENTRIONALIS occurred in northern Michigan. In that study, 73% of the entire population was found in 5 mines and 86% in 8 mines of the 21 mines containing the species. Individuals usually roost solitarily.

In summer, these bats generally are colonial, but reproductive females and juveniles often roost alone. As many as 60 adults have been found in a single tree (Foster and Kurta 1999).

No single population of significant size has been studied intensively or long enough to determine population structure. Habitat utilization biases are reflected in sex ratios of animals captured during the summer, when females are more frequently taken near streams and males are more frequently taken at caves. Sex ratio data from hibernacula are more consistent. Griffin (1940) reported on sex ratios from New England hibernacula, where he found males comprised 77.8% of a sample population of 877 individuals over an 8 year period. In southern Illinois, Pearson (1962) found 72% males among the groups hibernating in silica mines and Hitchcock (1949) found that 76.0% of 242 individuals hibernating in eastern Canada were males and that the sexes did not segregate during hibernation. In northern Michigan, males comprised 60% of winter populations and were more abundant than females in all but 3 of 21 mines searched (Stones 1981).

The disparity in the sex ratio appears to be quite consistent among studies, seasons, and sites. Griffin (1940) suggested that females may have a higher mortality rate than males and consequently, a shorter life span and lower representation in the population. Hitchcock's (1949) original data recently were statistically analyzed and shown to support this hypothesis (Hitchcock et al. 1984).

Although age structure is not known for any population, potential longevity is at least two decades. Hall et al. (1957) reported one banded M. SEPTENTRIONALIS that was found recently dead in the cave in which it had been banded almost 19 years earlier.

In West Virginia, foraging home ranges of seven females averaged 61.1 hectares (Menzel et al. 1999).

In Michigan, radio-tagged bats in spring-summer changed roosts every 2 days; distance between roosts was 6-2000 m (Foster and Kurta 1999).

In an experiment to determine the homing ability of blinded and deafened bats, a blinded individual returned 32 miles to its home cave in 2.5 hr after being held in captivity for 3 days (Stones and Branick 1969). The return rate of this animal was at an average, straight-line speed of 12.8 miles per hour. Overall, blinded bats returned to their home cave at the same frequency as did the control animals over the 6-week period following their release. However, none of the bats with impaired hearing returned during that time.

No significant predators are known (Baker 1983). Reported parasites include chiggers, mites, and trematodes (Whitaker and Winter 1977, Whitaker and Mumford 1971).
Non-Migrant: Y
Locally Migrant: Y
Long Distance Migrant: N
Mobility and Migration Comments: Information on migration is scanty. Barbour and Davis (1969) reported that the winter and summer geographic ranges of the species appear to be identical. However, the lack of hibernacula and gravid or nursing females in some areas indicates that significant portions of the population may move seasonally. Late summer swarming behavior resulting in relatively high concentrations at some caves indicates that there is some degree of local or regional movement prior to reproduction. The low numbers of females captured at cave entrances and along streams throughout the summer in Missouri indicates dispersal to maternity sites, perhaps beyond the cave region of the state (Caire et al. 1979). The lack of hibernacula in southern Michigan suggests that bats must migrate either south to the karst regions of Indiana and Ohio or north to the abandoned mines of the Upper Peninsula to overwinter (Kurta 1982).

A few observations indicate that this species is capable of moving relatively long distances, often in a short period of time. One male recaptured by Caire et al. (1979) in Missouri had traveled at least 56 km in about one month, from its cave of origin to its apparent summering area where it was found behind the shutter of a house. Griffin (1945) reported one individual that flew approximately 60 miles between two caves sometime between February and April of the same year.
Palustrine Habitat(s): Riparian
Terrestrial Habitat(s): Forest - Conifer, Forest - Hardwood, Forest - Mixed, Urban/edificarian, Woodland - Conifer, Woodland - Hardwood, Woodland - Mixed
Subterranean Habitat(s): Subterrestrial
Special Habitat Factors: Standing snag/hollow tree
Habitat Comments: This bat generally is associated with old-growth forests composed of trees 100 years old or older. It relies on intact interior forest habitat, with low edge-to-interior ratios. Relevant late-successional forest features include a high percentage of old trees, uneven forest structure (resulting in multilayered vertical structure), single and multiple tree-fall gaps, standing snags, and woody debris. These late successional forest characteristics may be favored for several reasons, including the large number of partially dead or decaying trees that the species uses for breeding, summer day roosting, andforaging. [Source: USFWS 2011, which see for citations of further literature]

Hibernation occurs in caves, mines, and tunnels from late fall through early spring (Kurta 1982, Mumford and Cope 1964, Jackson 1961, Griffin 1940, and others). Hibernators frequently roost in crevices, drill holes, and similar sites (Caire et al. 1979, Pearson 1962, Layne 1958, Griffin 1940), but roosting in the open is not uncommon.

Use of different types of hibernacula can vary considerably among areas, depending upon quality and availability of sites. In a study of 71 potential hibernation sites, including large and small caves, overhangs, and mines, on the Shawnee National Forest in southern Illinois (Whitaker and Winter 1977), mines were the only occupied habitat. Mines also are the principal hibernation sites in northern Michigan where there are no caves (Stones 1981). In the northeastern U.S., hibernation sites include mines and caves (Griffin 1940, Hall et al. 1957) as well as large, cavelike water conduit tunnels (G. Hammerson, pers. obs.).

The principal requirements of a suitable hibernation site are winter-long, low temperatures above freezing, high humidity, and lack of disturbances, both natural (floods) and anthropogenic (visitation) (Barbour and Davis 1969, Hitchcock 1949). At least two studies have provided contradictory information on thermal habitat preferences, suggesting that warmer temperatures sometimes are selected or at least tolerated. In Illinois, Pearson (1962) found that the mean temperature at hibernation sites averaged 9.7 C. Stones (1981) studied the occurrence of bats in northern Michigan mines that were vertically thermally stratified. The mean ambient temperature was 5.9 C, with 43% of the population occurring in the range 7-8 C and 6.5% occurring in the range 9-11 C.

There appears to be a high degree of philopatry in hibernaculum use. In Missouri, over 90% of recaptured banded individuals, representing 5% of the original banded population of 945 (753 males and 192 females), were recaptured at their cave of origin (Caire et al. 1979). Mills (1971) recaptured 4.8% of 358 individuals at their cave of origin the year after banding. Griffin (1945) found that of over 13,000 banded bats of various species, of which about 8,500 were banded in their winter hibernacula, the ratio was 100:1 for bats that were observed to return to their cave of origin over subsequent winters vs. those that were recaptured elsewhere.

Night roosts used in summer between foraging bouts are in different habitats than day roosts. Caves, mines, and quarry tunnels are used as night roosts, typically by males, but also by nonreproductive females (Clark et al. 1987, Jones et al. 1967). They are joined later in the summer by juveniles and post-lactating females (Kunz, 1973). During the day, these same sites usually house no M. SEPTENTRIONALIS. Daytime observations typically are of individuals in crevices or hollows or under loose bark on trees (Foster and Kurta 1999) and in a variety of small spaces associated with buildings and other structures (Hoffmeister 1989, Caire et al. 1979, Hamilton and Whitaker 1979, Barbour and Davis 1969). At times M. SEPTENTRIONALIS has been found in or around caves on summer nights, but not actually roosting in them (Mills 1971). Early in the summer, these groups mostly comprise males, with females and young-of-the-year joining later in the season (Caire et al. 1979).

Nothing has been published on the fidelity of individuals or colonies to particular swarming sites, nor the relationship of swarming site selection to hibernaculum and summer roost selection. Given the low numbers found in most hibernacula and summer night roosts relative to the higher numbers found at swarming sites, it appears that certain caves serve as congregation points for fall mating activity. However, short-term banding returns at swarming sites are very low, indicating movement among swarming sites (Kurta, pers. comm.).

Nursery colonies have rarely been located. Those that have been found were small and in a variety of sites, including a barn (Cope and Humphrey 1972) and a small cabin (Brandon 1961), though most likely the majority occur under the loose bark of trees, similar to the colonies reported from Indiana (Mumford and Cope 1964). Perhaps the single largest colony reported was found in a barn in Indiana (Cope and Humphrey 1972) on 22 June comprising 24 adult females, 12 immature females, and 18 immature males; 10 other adults escaped. Of the 24 females, 23 were lactating and 1 was pregnant. The ratio of number of adults to young confirmed the suspected litter size of one.

Maternity roosts are warm sites that maximize the growth rate of young while providing protection from predation and the weather. Cool summer temperatures can slow juvenile growth, thereby reducing the fat accumulation period prior to hibernation, and ultimately increasing the risk of overwintering mortality in young-of-the-year (McNab 1982).

Sex ratios from summer studies in different habitats demonstrate sexual dimorphism in habitat selection at this time of the year. In riparian areas in Iowa, Kunz (1971) found a 2:1 ratio of females to males, with most males taken in May and late August, apparently during migration. Caire et al. (1979), trapping at caves, found a preponderance of males.

Small, highly fragmented, or young forests that provide limited areas of subcanopy foraging habitat may not be suitable. Young forests may also lack appropriate nursery sites. A lack of suitable hibernacula may prevent occupancy of areas that otherwise

have adequate habitat (Kurta 1982).
Adult Food Habits: Invertivore
Immature Food Habits: Invertivore
Food Comments: Evidently an opportunistic insectivore (Kunz 1973); prey composition varies widely among sites and seasons; diet includes Lepidoptera, Coleoptera, Neuroptera, Diptera, Hymenoptera, Homoptera, and Hemiptera (Whitaker 1972, LaVal and LaVal 1980, Griffith and Gates 1985). The presence of green plant material in some individuals, suggesting that some insects may have been gleaned from vegetation, is consistent with this species large ears and high echolocation frequency which provide better resolution of target detail (Fenton 1982).

Foraging typically occurs in forested habitats, above and below the canopy; forages also over forest clearings and occasionally over water. Eleven individuals (10 males, 1 female) tagged with chemical lights observed during the summer in Missouri (LaVal et al. 1977), foraged almost exclusively among the trees of hillside and ridge forests, rather than utilizing floodplain and riparian forests; frequently foraging occurred within 1 to 3 m of the ground. Foraging bats doubled back frequently and only slowly moved out of the observation area. In Iowa, Kunz (1973, 1971) found primarily females foraging in mature deciduous uplands with adjacent deep ravines and in a disturbed riparian area with an adjacent floodplain and agricultural lands.
Adult Phenology: Hibernates/aestivates, Nocturnal
Immature Phenology: Hibernates/aestivates, Nocturnal
Phenology Comments: Hibernation occurs from late summer/early fall to spring. In more northerly locations, hibernation begins earlier in the fall and extends later into the spring. In Missouri, hibernation has been reported from October to late March, with numbers of individuals captured at cave entrances beginning to decline significantly in September (Caire et al. 1979). In Michigan's Upper Peninsula, hibernation began by late August, while the earliest reported capture of an active bat in the spring was a gravid female on 29 May (Kurta 1980) in the southern Lower Peninsula. In New England, arrival at hibernation caves begins by early October (Griffin 1940). In Indiana, a few flew outside a hibernation site periodically throughout winter, especially in mild weather; feeding apparently did not begin until mid-March (Whitaker and Rissler 1992).

In summer, an activity peak generally occurs 1-2 hours after sunset, with a secondary peak 7-8 hours after sunset. Nocturnal insects often exhibit a strong flight period among nocturnal insects beginning before sunset, peaking near midnight, and waning throughout the early morning hours, and a second but less intense flight period may occur before sunrise (see Kunz 1973). In Iowa, both LASIONYCTERIS NOCTIVAGANS and MYOTIS SEPTENTRIONALIS showed a similar bimodal activity pattern with a period of reduced activity from 4 to 6 hours after sunset (Kunz 1973).
Colonial Breeder: Y
Length: 95 centimeters
Weight: 8 grams

Economic Attributes — Not yet assessed
Management Summary — Expand
Population/Occurrence Delineation — Expand
Population/Occurrence Viability — Expand
U.S. Invasive Species Impact Rank (I-Rank) — Not yet assessed
Authors/Contributors — Expand
References — Expand
Use Guidelines & Citation — Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Perimyotis subflavus - (Menu, 1984)
Tricolored Bat

Google
Search for Images on Google

Other English Common Names: Eastern Pipistrelle , Tricoloured Bat
Synonym(s): *Pipistrellus subflavus* (F. Cuvier, 1832)
Taxonomic Status: Accepted
Related ITIS Name(s): *Pipistrellus subflavus* (F. Cuvier, 1832) (TSN 180025)
French Common Names: pipistrelle de l'Est
Spanish Common Names: Un Murciélago
Unique Identifier: ELEMENT_GLOBAL.2.102580
Element Code: AMACC03020
Informal Taxonomy: Animals, Vertebrates - Mammals - Bats

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Mammalia	Chiroptera	Vespertilionidae	Perimyotis

Genus Size: A - Monotypic genus

Check this box to expand all report sections: ☐

Concept Reference
Expand

Conservation Status
Collapse

NatureServe Status

Global Status: G3
Global Status Last Reviewed: 23Jul2012
Global Status Last Changed: 23Jul2012
Ranking Methodology Used: Ranked by calculator
Rounded Global Status: G3 - Vulnerable
Reasons: Large range in eastern and central North America; many occurrences; presumed large population but has declined greatly since 2006 from the effects of a rapidly spreading fungal disease (white-nose syndrome). NatureServe's Rank Estimator version 3.09 indicated a global rank of G3.
Nation: United States
National Status: N3 (23Jul2012)
Nation: Canada
National Status: N2N3 (01Jan2012)

U.S. & Canada State/Province Status	
	Alabama (S3), Arkansas (S5), Connecticut (S4), Delaware (S4), District of Columbia (S4), Florida (SNR), Georgia

United States	(S5), Illinois (S5), Indiana (S4), Iowa (S4), Kansas (S4), Kentucky (S4S5), Louisiana (S4S5), Maine (SU), Maryland (S5B,S5N), Massachusetts (S3), Michigan (S2), Minnesota (S3), Mississippi (S5), Missouri (S4), Nebraska (S1), New Hampshire (S1N,SUB), New Jersey (SU), New Mexico (S3), New York (S3), North Carolina (S3), Ohio (SNR), Oklahoma (S4), Pennsylvania (S1), Rhode Island (S4), South Carolina (SNR), Tennessee (S5), Texas (S5), Vermont (S1), Virginia (S3), West Virginia (S5), Wisconsin (S1S3)
Canada	New Brunswick (S2?), Nova Scotia (S1?), Ontario (S3?), Quebec (S1)

Other Statuses

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Endangered (01Nov2013)
Comments on COSEWIC: This bat is one of the smallest bats in eastern North America. Approximately 10% of its global range is in Canada, and it is considered rare in much of its Canadian range. Declines of more than 75% have occurred in the known hibernating populations in Québec and New Brunswick due to White-nose Syndrome. This fungal disease, caused by an invasive pathogen, was first detected in Canada in 2010, and has caused similar declines in Little Brown Myotis and Northern Myotis in Canada and the northeastern United States. Most of the Canadian range of the species overlaps with the current White-nose Syndrome range, and further declines are expected as more hibernacula continue to become infected.

Designated Endangered in an emergency assessment on February 3, 2012. Status re-examined and confirmed in November 2013.
IUCN Red List Category: LC - Least concern

NatureServe Global Conservation Status Factors

Range Extent: >2,500,000 square km (greater than 1,000,000 square miles)
Range Extent Comments: Range extends from Nova Scotia, southern Quebec, Michigan (Kurta and Teramino 1994), and Minnesota south to Honduras, Texas, Gulf Coast, and Florida, west to South Dakota, Colorado, western Texas, and New Mexico (Valdez et al. 2009)..

Number of Occurrences: > 300
Number of Occurrences Comments: This species is represented by a large number of occurrences (subpopulations and locations).

Population Size: 10,000 - 1,000,000 individuals
Population Size Comments: Total adult population size is unknown but presumably exceeds 10,000.

See Arita (1993) for information on population size in Mexico.

Overall Threat Impact: High
Overall Threat Impact Comments: Primary threat is a recently recognized fungal pathogen that causes a generally fatal condition known as white-nose syndrome (WNS), which attacks hibernating bats. WNS has spread rapidly (confirmed in more than 100 bat hibernacula) and now has been documented throughout northeastern North America. The fungus that causes WNS (*Geomyces destructans*) likely was recently introduced from Europe (Warnecke et al. 2012).

Otherwise, no major threats are known.

Short-term Trend: Decline of 30-70%
Short-term Trend Comments: Range-wide trend over the past 10 years or three generations (perhaps roughly 15 years) is not precisely known, but abundance has greatly declined in the core of the range in northeastern North America since 2006 as a result of a rapidly spreading fungal disease (white-nose syndrome) (Franci et al. 2012, Langwig et al. 2012). The rate of decline of tricolored bat populations in northeastern North America decreased with time, and populations stabilized at much lower levels 3-4 years after WNS was detected (Langwig et al. 2012). Prior to 2006, population data for the species indicated no evidence of a decline (Ellison et al. 2003).

See Arita (1993) for general information on conservation status in Mexico.

Long-term Trend: Decline of 30-70%

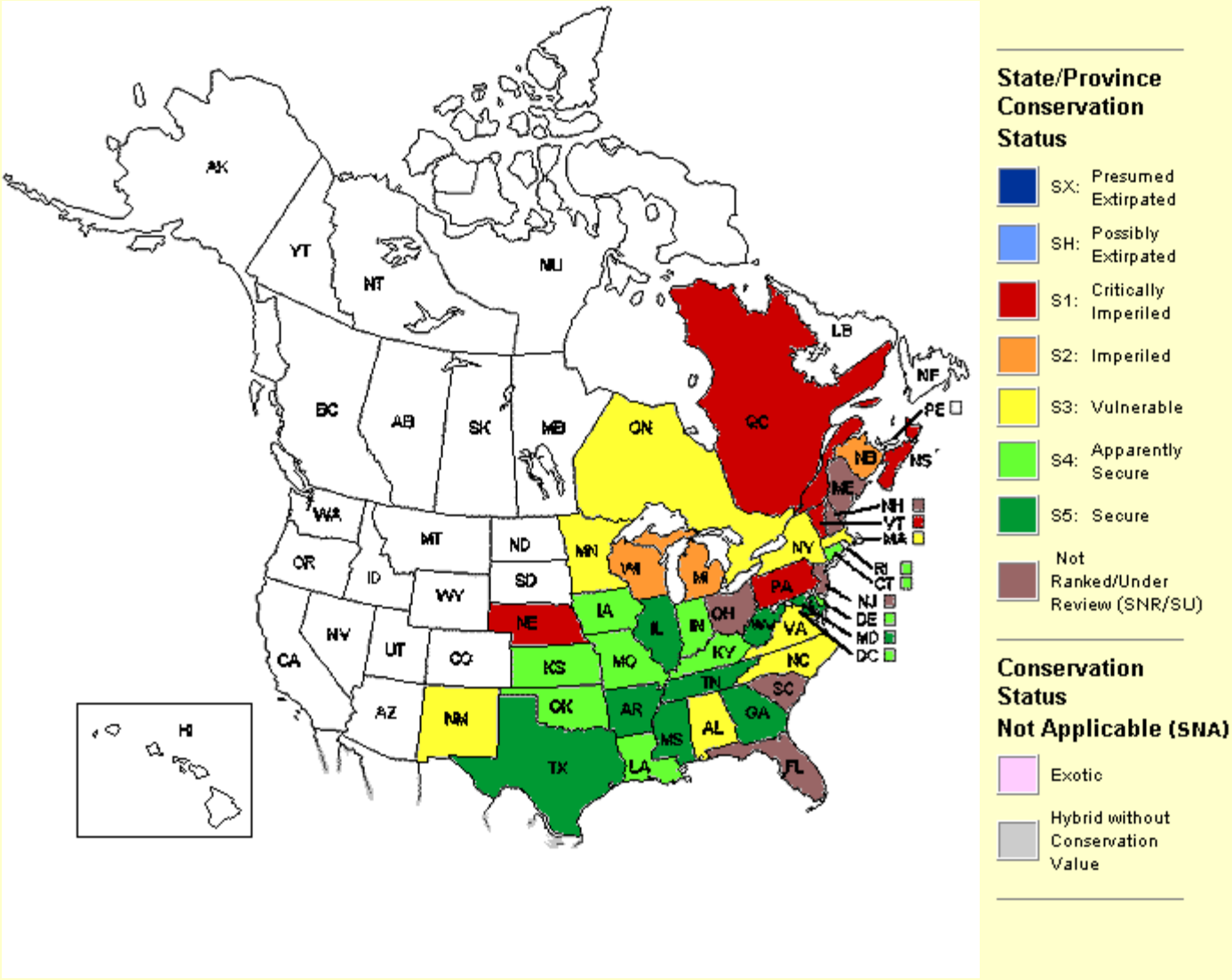
Other NatureServe Conservation Status Information

Distribution

Collapse

Global Range: (>2,500,000 square km (greater than 1,000,000 square miles)) Range extends from Nova Scotia, southern Quebec, Michigan (Kurta and Teramino 1994), and Minnesota south to Honduras, Texas, Gulf Coast, and Florida, west to South Dakota, Colorado, western Texas, and New Mexico (Valdez et al. 2009)..

U.S. States and Canadian Provinces

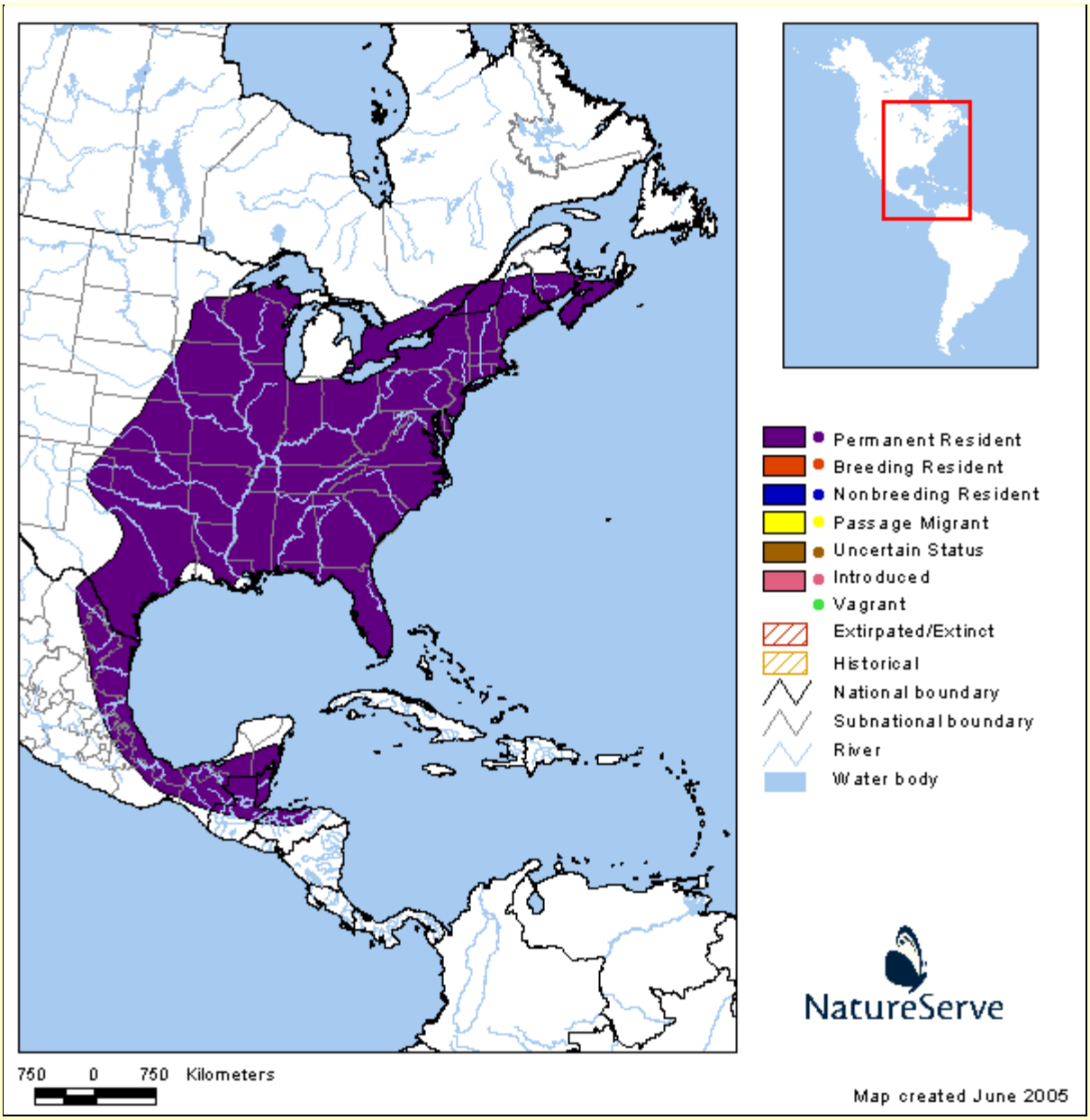


Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	AL, AR, CT, DC, DE, FL, GA, IA, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, NC, NE, NH, NJ, NM, NY, OH, OK, PA, RI, SC, TN, TX, VA, VT, WI, WV
Canada	NB, NS, ON, QC

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: NatureServe, 2005; Sechrest, 2002

U.S. Distribution by County	
State	**County Name (FIPS Code)**
IA	Guthrie (19077)
IN	Bartholomew (18005), Brown (18013), Crawford (18025), Daviess (18027), Dubois (18037), Gibson (18051), Greene (18055), Harrison (18061), Johnson (18081), Knox (18083), Lawrence (18093), Martin (18101), Monroe (18105), Morgan (18109), Newton (18111), Orange (18117), Pike (18125), Porter (18127), Vigo (18167), Washington (18175)
MN	Anoka (27003)*, Carlton (27017), Carver (27019)*, Chisago (27025)*, Dakota (27037)*, Dodge (27039)*, Fillmore (27045), Goodhue (27049), Hennepin (27053), Houston (27055), Lake (27075), Le Sueur (27079), Nicollet (27103), Olmsted (27109)*, Ramsey (27123), Rice (27131)*, Scott (27139)*, Sibley (27143)*, St. Louis (27137), Stearns (27145)*, Wabasha (27157), Washington (27163), Winona (27169)
MS	Adams (28001), Forrest (28035), Grenada (28043), Perry (28111), Smith (28129), Stone (28131), Tishomingo (28141), Wayne (28153)
NE	Cass (31025), Dakota (31043), Sarpy (31153), Thurston (31173)
NH	Coos (33007), Merrimack (33013)

VT	Addison (50001), Bennington (50003), Chittenden (50007), Orange (50017), Rutland (50021), Washington (50023), Windham (50025), Windsor (50027)
WI	Calumet (55015), Columbia (55021), Crawford (55023), Dane (55025), Dodge (55027), Door (55029), Dunn (55033), Grant (55043), Iowa (55049), Lafayette (55065), Manitowoc (55071), Monroe (55081), Pepin (55091), Pierce (55093), Richland (55103), Sauk (55111), St. Croix (55109), Vernon (55123)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
01	Lower Androscoggin (01040002)+, Upper Connecticut-Mascoma (01080104)+, White (01080105)+, Black-Ottauquechee (01080106)+, West (01080107)+, Deerfield (01080203)+
02	Hudson-Hoosic (02020003)+
03	Upper Chickasawhay (03170002)+, Black (03170007)+, Middle Pearl-Strong (03180002)+
04	Beaver-Lester (04010102)+, St. Louis (04010201)+, Lake Superior (04020300)+, Manitowoc-Sheboygan (04030101)+, Door-Kewaunee (04030102)+, Little Calumet-Galien (04040001)+, Otter Creek (04150402)+, Winooski River (04150403)+, Lake Champlain (04150408)+
05	Middle Wabash-Busseron (05120111)+, Upper White (05120201)+, Lower White (05120202)+, Driftwood (05120204)+, Lower East Fork White (05120208)+, Patoka (05120209)+, Blue-Sinking (05140104)+, Highland-Pigeon (05140202)+
06	Bear (06030006)+
07	Clearwater-Elk (07010203)+*, Twin Cities (07010206)+, Middle Minnesota (07020007)+, Lower Minnesota (07020012)+*, Lower St. Croix (07030005)+, Rush-Vermillion (07040001)+, Cannon (07040002)+*, Buffalo-Whitewater (07040003)+, Zumbro (07040004)+, La Crosse-Pine (07040006)+, Root (07040008)+, Lower Chippewa (07050005)+, Coon-Yellow (07060001)+, Grant-Little Maquoketa (07060003)+, Apple-Plum (07060005)+, Castle Rock (07070003)+, Lower Wisconsin (07070005)+, Kickapoo (07070006)+, Upper Rock (07090001)+, Pecatonica (07090003)+, South Raccoon (07100007)+, Kankakee (07120001)+
08	Yalobusha (08030205)+, Homochitto (08060205)+
10	Lower Platte (10200202)+, Blackbird-Soldier (10230001)+

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Reproduction Comments: Mates in October/November. Litter size usually is 2, born June to mid-July in north, May in south. Probably sexually mature 1st summer. Young able to fly within a month. Maternity colonies are small.
Ecology Comments: Probably feeds within a 5-mile radius of its roosting site. In spring and summer in Indiana, the maximum distance traveled by 19 radio-tagged reproductive females was 4.3 km (Veilleux et al. 2003). Probably occurs in low densities. Relatively uncommon. Generally solitary or in small groups.
Non-Migrant: Y
Locally Migrant: Y
Long Distance Migrant: N
Mobility and Migration Comments: Some in northern populations engage in annual latitudinal migrations (Fraser et al. 2012).
Palustrine Habitat(s): Riparian
Terrestrial Habitat(s): Grassland/herbaceous, Old field, Suburban/orchard, Urban/edificarian, Woodland - Hardwood
Subterranean Habitat(s): Subterrestrial
Special Habitat Factors: Standing snag/hollow tree
Habitat Comments: These bats prefer partly open country with large trees and woodland edges. They avoid deep woods and open fields. Summer roosts probably are mainly in tree foliage (including attached lichen clumps) and occasionally in buildings; caves may be used as night roosts between foraging forays. Hibernation sites usually are in caves or mines with high humidity. Generally, maternity colonies utilize manmade structures or tree cavities; often these are in open sites that would not be tolerated by most other bats (Schmidly 1991). However, in Indiana, pregnant and lactating females roosted exclusively in

foliage, typically in clusters of dead leaves and less often in live foliage or squirrel nests (Veilleux et al. 2003).
Adult Food Habits: Invertivore
Immature Food Habits: Invertivore
Food Comments: Solitary feeder on various flying insects. Forages at treetop level, often over water.
Adult Phenology: Hibernates/aestivates, Nocturnal
Immature Phenology: Hibernates/aestivates, Nocturnal
Phenology Comments: Feeds after dark until dawn. Has intermittent feeding periods to midnight and another period of feeding activity toward dawn. Rarely may fly outside hibernation site in winter (Whitaker and Rissler 1992).
Colonial Breeder: Y
Length: 9 centimeters
Weight: 6 grams

Economic Attributes	Not yet assessed
Management Summary	Not yet assessed
Population/Occurrence Delineation	Expand
Population/Occurrence Viability	Expand
U.S. Invasive Species Impact Rank (I-Rank)	Not yet assessed
Authors/Contributors	Expand
References	Expand
Use Guidelines & Citation	Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Phenacomys ungava - Merriam, 1889
Eastern Heather Vole

Taxonomic Status: Accepted
Related ITIS Name(s): *Phenacomys ungava* Merriam, 1889 (TSN 552492)
French Common Names: campagnol d'Ungava, phénacomys d'Ungava
Unique Identifier: ELEMENT_GLOBAL.2.103453
Element Code: AMAFF10050
Informal Taxonomy: Animals, Vertebrates - Mammals - Rodents

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Mammalia	Rodentia	Cricetidae	Phenacomys

Genus Size: B - Very small genus (2-5 species)

Check this box to expand all report sections: ☐

Concept Reference

Expand

Conservation Status

Collapse

NatureServe Status

Global Status: G5
Global Status Last Reviewed: 15Jun2000
Global Status Last Changed: 15Jun2000
Rounded Global Status: G5 - Secure
Reasons: Wide distribution in North America; many protected occurrences; no known large-scale threats.
Nation: United States
National Status: NNR
Nation: Canada
National Status: N5 (01Jan2012)

U.S. & Canada State/Province Status	
United States	Minnesota (S3)
Canada	Alberta (S5), Labrador (SNR), Manitoba (S5), Northwest Territories (S5), Nunavut (SNR), Ontario (S4), Quebec (S4), Saskatchewan (S5), Yukon Territory (S4)

Other Statuses

IUCN Red List Category: LC - Least concern

NatureServe Global Conservation Status Factors

Range Extent: >2,500,000 square km (greater than 1,000,000 square miles)
Range Extent Comments: Labrador west to southern Yukon Territory, south to southern Alberta (Wilson and Reeder 1993), southcentral Saskatchewan, southeastern Manitoba, northeastern Minnesota (Jannett and Oehlenschlager 1997), southern Ontario, and southern Quebec (McAllister and Hoffmann 1988). For recent records from Minnesota, see Etnier (1989).

Number of Occurrences: 81 to >300
Number of Occurrences Comments: At least hundreds of known locations.

Population Size: 10,000 to >1,000,000 individuals

Short-term Trend: Unknown
Short-term Trend Comments: Unknown

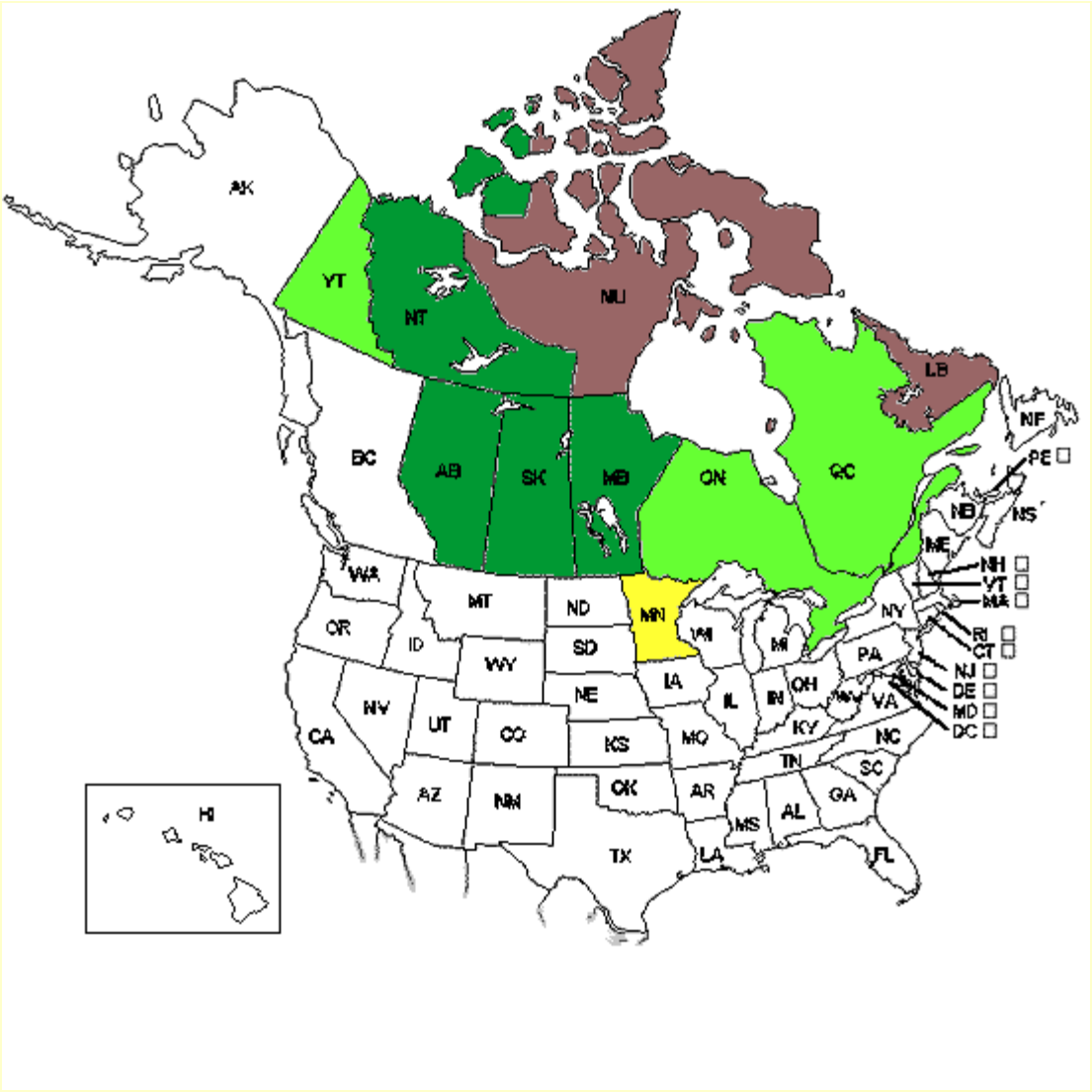
Other NatureServe Conservation Status Information

Distribution

Collapse

Global Range: (>2,500,000 square km (greater than 1,000,000 square miles)) Labrador west to southern Yukon Territory, south to southern Alberta (Wilson and Reeder 1993), southcentral Saskatchewan, southeastern Manitoba, northeastern Minnesota (Jannett and Oehlenschlager 1997), southern Ontario, and southern Quebec (McAllister and Hoffmann 1988). For recent records from Minnesota, see Etnier (1989).

U.S. States and Canadian Provinces



State/Province Conservation Status

- SX: Presumed Extirpated
- SH: Possibly Extirpated
- S1: Critically Imperiled
- S2: Imperiled
- S3: Vulnerable
- S4: Apparently Secure
- S5: Secure
- Not Ranked/Under Review (SNR/SU)

Conservation Status Not Applicable (SNA)

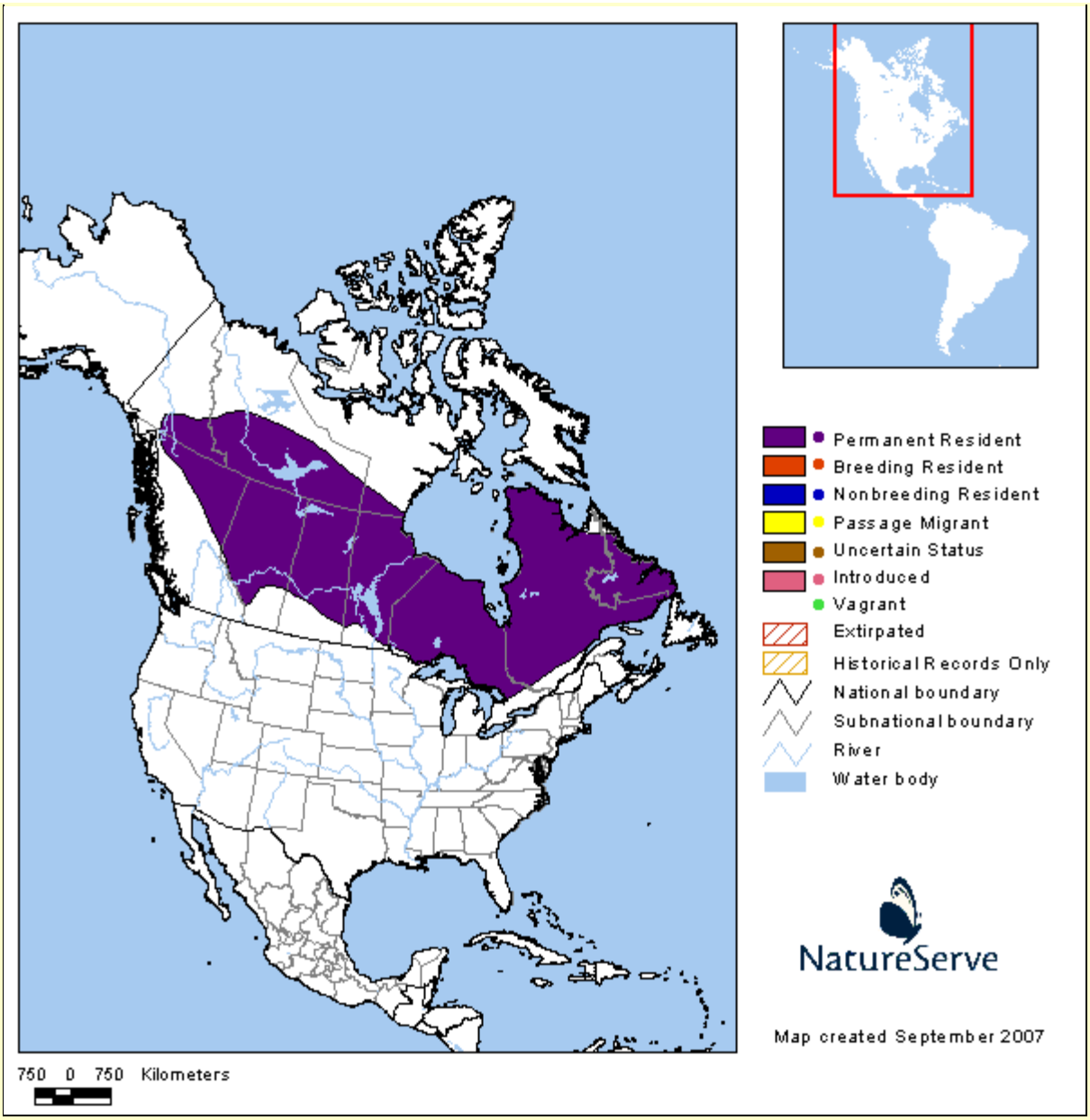
- Exotic
- Hybrid without Conservation Value

Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	MN
Canada	AB, LB, MB, NT, NU, ON, QC, SK, YT

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: Sechrest, 2002

U.S. Distribution by County	
State	**County Name (FIPS Code)**
MN	Cook (27031), Lake (27075), St. Louis (27137)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
04	Baptism-Brule (04010101)+
09	Rainy Headwaters (09030001)+, Vermilion (09030002)+

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: A small, relatively short-tailed vole.

Economic Attributes	Not yet assessed
Management Summary	Not yet assessed
Population/Occurrence Delineation	Expand
Population/Occurrence Viability	Expand
U.S. Invasive Species Impact Rank (I-Rank)	Not yet assessed
Authors/Contributors	Expand
References	Expand
Use Guidelines & Citation	Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Picoides dorsalis - Baird, 1858
American Three-toed Woodpecker
Other English Common Names: Three-toed Woodpecker
Synonym(s): *Picoides tridactylus dorsalis*
Taxonomic Status: Accepted
Related ITIS Name(s): *Picoides dorsalis* S. F. Baird, 1858 (TSN 685725)
French Common Names: pic à dos rayé
Unique Identifier: ELEMENT_GLOBAL.2.106444
Element Code: ABNYF07110
Informal Taxonomy: Animals, Vertebrates - Birds - Other Birds

Google
Search for Images on Google

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Aves	Piciformes	Picidae	Picoides

Genus Size: C - Small genus (6-20 species)

Check this box to expand all report sections: ☐

Concept Reference
Expand

Conservation Status
Collapse

NatureServe Status

Global Status: G5
Global Status Last Reviewed: 30Sep2003
Global Status Last Changed: 02Dec1996
Rounded Global Status: G5 - Secure
Reasons: Extensive Holarctic distribution with numerous occurrences, but uncommon in most areas; threatened in some areas by timber harvest, incompatible forestry practices, and probably by fire suppression; more information is needed. Trends unknown, but quite likely downward.
Nation: United States
National Status: N5 (05Jan1997)
Nation: Canada
National Status: N5 (12Feb2012)

U.S. & Canada State/Province Status	
United States	Alaska (S5), Arizona (S3), Colorado (S3S4), Idaho (S2), Maine (S3), Michigan (SNRN), Minnesota (SNRB,SNRN), Montana (S4), Navajo Nation (S3), Nevada (S2), New Hampshire (S2), New Mexico (S3B,S3N), New York (S2), Oregon (S3), South Dakota (S2), Utah (S3), Vermont (S1), Washington (S3), Wyoming (S3)

Canada	Alberta (S4), British Columbia (S5B), Labrador (S5), Manitoba (S5), New Brunswick (S3?), Newfoundland Island (S3S4), Northwest Territories (S4S5), Nova Scotia (S1S2), Nunavut (SNR), Ontario (S4), Prince Edward Island (S1), Quebec (S4), Saskatchewan (S4B,S4N), Yukon Territory (S5)

Other Statuses

IUCN Red List Category: LC - Least concern

NatureServe Global Conservation Status Factors

Range Extent: >2,500,000 square km (greater than 1,000,000 square miles)
Range Extent Comments: RESIDENT: often locally, in North America from northern Alaska across Canada through northern Saskatchewan to north-central Labrador and Newfoundland, south to western and southern Alaska, southern Oregon, eastern Nevada, central Arizona, southern New Mexico, and the Black Hills of South Dakota; and to central Alberta and Saskatchewan, southern Manitoba, northeastern Minnesota, northern Michigan, central Ontario, northern New England, southern Quebec and Nova Scotia.

Area of Occupancy: >12,500 4-km2 grid cells
Area of Occupancy Comments:

Number of Occurrences: > 300
Number of Occurrences Comments: Widespread, Holarctic range.

Population Size: >1,000,000 individuals
Population Size Comments: Locally distributed and nowhere very numerous; not enough information to determine absolute abundance. However, some measured densities in unburned forests are 0.25/ha (Colorado; Koplin 1969), less than 0.1/ha in Alaska (Murphy and Lehnhausen 1998), 0.06/100 ha (Finland, unprotected forests; Virkkala et al. 1994), and 0.7/100 ha (Finland, virgin forests; Virkkala et al. 1991). Densities are significantly higher in burned forests, 1-2 years post-fire (1.2/ha in Colorado, Koplin 1969; 0.2/ha in Alaska, Murphy and Lehnhausen 1998). Using the lower densities above as a guide, total population undoubtedly exceeds 1 million, and is probably substantially more.

Number of Occurrences with Good Viability/Integrity: Many to very many (41 to >125) occurrences with good viability

Overall Threat Impact Comments: Threats include incompatible forestry practices and deforestation. This species' association with spatially unpredictable disturbance and its large home range make it sensitive to logging and forest fragmentation, and these activities have undoubtedly resulted in population declines (Hunter 1992, Hagan et al. 1997, Imbeau et al. 1999, Leonard 2001). In many cases, this species is restricted to forests older than planned cutting rotations (Imbeau et al. 1999). In Finland, has declined or disappeared in old-growth tracts less than about 140 square kilometers in area (Vaisanen et al. 1986). In Oregon, the liquidation of old growth lodgepole pine due to its infestation with the mountain pine beetle may reduce or eliminate habitat for this species. In Vermont, clear-cutting threatens the black spruce-balsam fir forest habitat.

Because densities increase following fires, probably detrimentally affected by fire suppression (Spahr et al. 1991).

Short-term Trend: Relatively stable to decline of 30%
Short-term Trend Comments: Not enough information to draw clear conclusions. Limited North American Breeding Bird Survey (BBS) data indicate a significant decline, although the data should be viewed with extreme caution geven the low number of samples (Sauer et al. 2001). Declining in Maine, likely a result of timber harvest (Hagan et al. 1997, cited in Leonard 2001). Beginning in the 1960s the number of sightings in Michigan increased. Observations in the 1970s and 1980s continued to increase in Michigan (Brewer et al. 1991); within the last six years, sightings have been much less common (Adams, pers. comm.).

In Eurasia, declining in former Yugoslavia and Czechoslovakia, and in Lithuania, Sweden and Finland (Cramp 1985, Ruge 1997, Vaisanen et al. 1986).

Long-term Trend: Relatively stable to decline of 50%

Long-term Trend Comments: Has been extirpated in parts of Eurasian range, although recolonization has been noted (Ruge 1997). In New York, was once abundant (1883), but more recently (1974), it is rare, though probably under-recorded (Peterson 1988). Was probably more numerous in Vermont than at present (Oatman 1985).

Other NatureServe Conservation Status Information

Inventory Needs: Rangewide inventory would help clarify status.

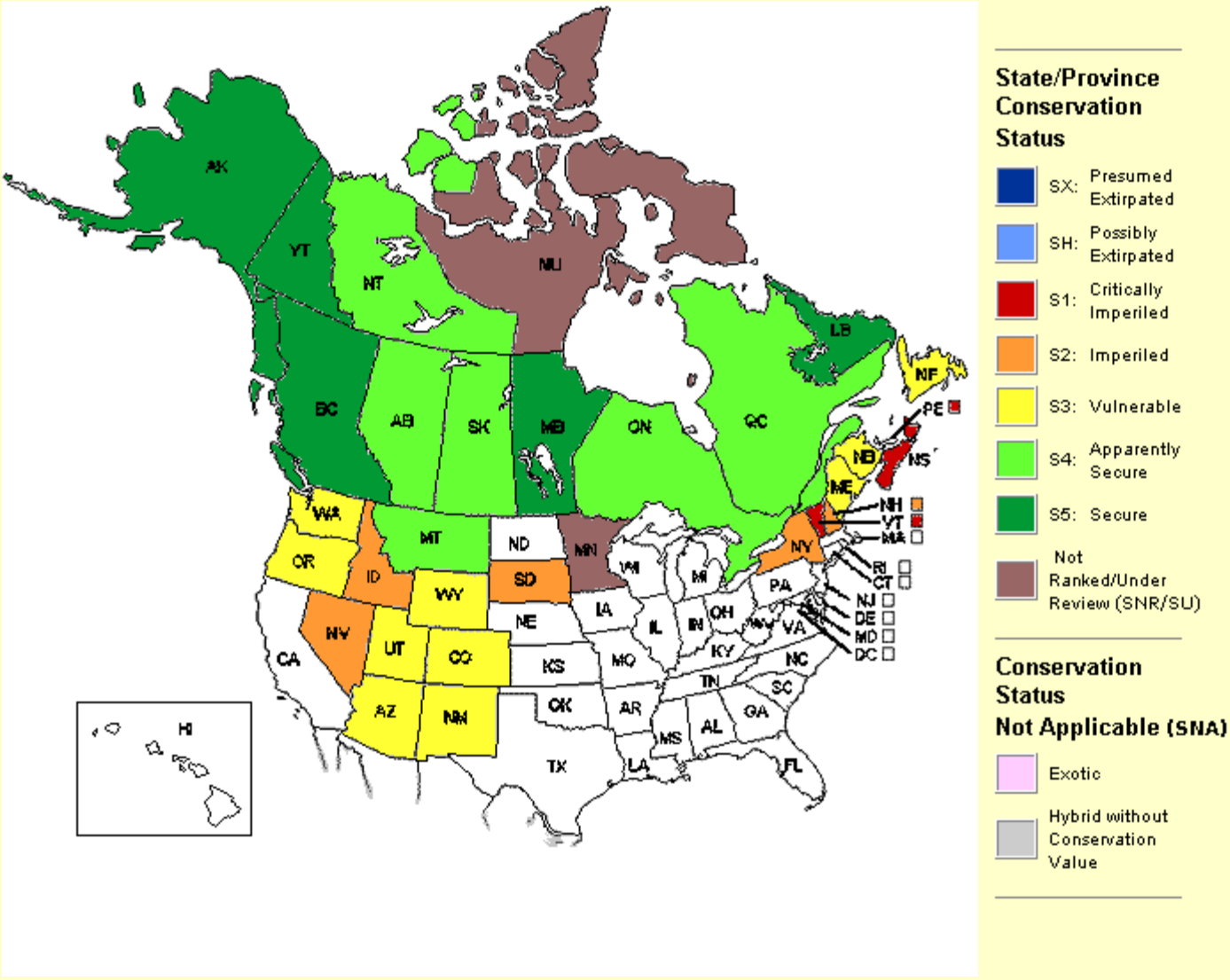
Protection Needs: Protect large forest tracts so that adequate habitat is continuously available as local conditions change through time.

Distribution

Collapse

Global Range: (>2,500,000 square km (greater than 1,000,000 square miles)) RESIDENT: often locally, in North America from northern Alaska across Canada through northern Saskatchewan to north-central Labrador and Newfoundland, south to western and southern Alaska, southern Oregon, eastern Nevada, central Arizona, southern New Mexico, and the Black Hills of South Dakota; and to central Alberta and Saskatchewan, southern Manitoba, northeastern Minnesota, northern Michigan, central Ontario, northern New England, southern Quebec and Nova Scotia.

U.S. States and Canadian Provinces



NOTE: The maps for birds represent the breeding status by state and province. In some jurisdictions, the subnational statuses for common species have not been assessed and the status is shown as not-assessed (SNR). In some jurisdictions, the subnational status refers to the status as a non-breeder; these errors will be corrected in future versions of these maps. A

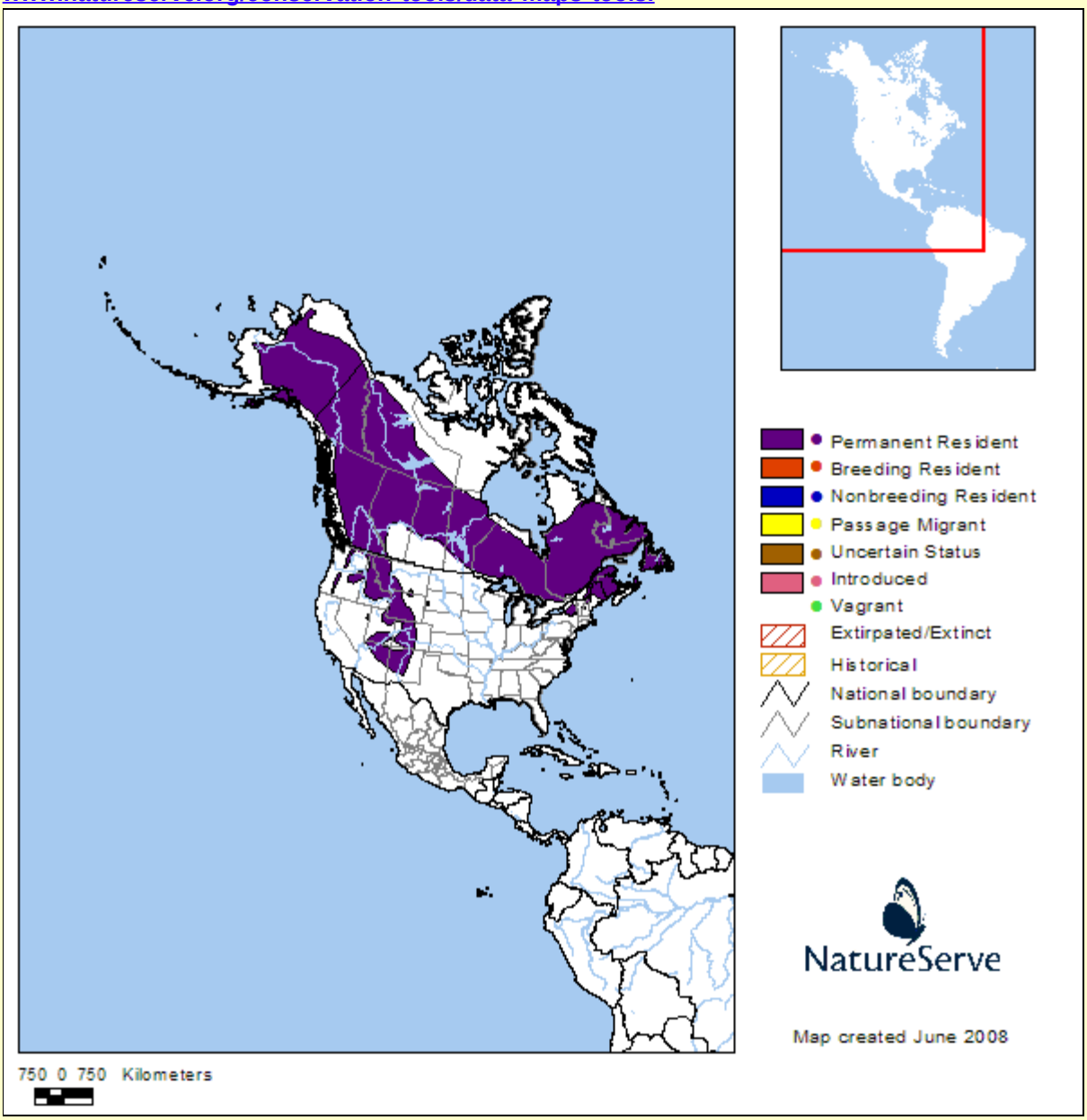
species is not shown in a jurisdiction if it is not known to breed in the jurisdiction or if it occurs only accidentally or casually in the jurisdiction. Thus, the species may occur in a jurisdiction as a seasonal non-breeding resident or as a migratory transient but this will not be indicated on these maps. See other maps on this web site that depict the Western Hemisphere ranges of these species at all seasons of the year.

Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	AK, AZ, CO, ID, ME, MI, MN, MT, NH, NM, NN, NV, NY, OR, SD, UT, VT, WA, WY
Canada	AB, BC, LB, MB, NB, NF, NS, NT, NU, ON, PE, QC, SK, YT

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: NatureServe 2008

U.S. Distribution by County

State	County Name (FIPS Code)
AZ	Apache (04001)
ID	Ada (16001), Adams (16003), Blaine (16013), Bonner (16017), Boundary (16021), Caribou (16029), Clark (16033), Clearwater (16035), Custer (16037), Elmore (16039), Idaho (16049), Kootenai (16055), Valley (16085)
NH	Coos (33007), Grafton (33009)
NM	San Juan (35045)
NY	Franklin (36033), Hamilton (36041), Herkimer (36043), Lewis (36049)
OR	Baker (41001), Coos (41011), Deschutes (41017), Grant (41023), Jackson (41029)*, Klamath (41035), Linn (41043)*, Umatilla (41059), Union (41061), Wallowa (41063)
SD	Custer (46033), Lawrence (46081), Pennington (46103)
UT	Beaver (49001), Cache (49005), Daggett (49009), Duchesne (49013), Garfield (49017)*, Grand (49019), Juab (49023)*, Kane (49025)*, Rich (49033), Salt Lake (49035), San Juan (49037), Sanpete (49039)*, Sevier (49041), Summit (49043), Uintah (49047), Utah (49049)*, Washington (49053)*
VT	Essex (50009), Franklin (50011), Orleans (50019)
WA	Chelan (53007)+*, Columbia (53013)+*, Ferry (53019)+*, King (53033)+*, Kittitas (53037)+*, Lewis (53041)+*, Okanogan (53047)+*, Pend Oreille (53051)+*, Pierce (53053)+*, Snohomish (53061)+*, Whatcom (53073)+*, Yakima (53077)+*
WY	Albany (56001), Big Horn (56003), Carbon (56007), Converse (56009)*, Crook (56011), Fremont (56013), Johnson (56019), Lincoln (56023), Natrona (56025), Park (56029), Sheridan (56033), Sublette (56035), Teton (56039), Uinta (56041), Washakie (56043)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed

Watershed Region	Watershed Name (Watershed Code)
01	Saco (01060002)+, Upper Connecticut (01080101)+
02	Mohawk (02020004)+
04	Salmon-Sandy (04140102)+, Black (04150101)+, St. Regis (04150306)+, Saranac River (04150406)+, Missiquoi River (04150407)+, St. Francois River (04150500)+
10	Madison (10020007)+, Yellowstone Headwaters (10070001)+, Clarks Fork Yellowstone (10070006)+*, Upper Wind (10080001)+, Little Wind (10080002)+*, Popo Agie (10080003)+*, Nowood (10080008)+, Big Horn Lake (10080010)+, South Fork Shoshone (10080013)+, Little Bighorn (10080016)+, Upper Tongue (10090101)+, Middle Fork Powder (10090201)+, Crazy Woman (10090205)+, Clear (10090206)+, Middle Cheyenne-Spring (10120109)+, Rapid (10120110)+, Middle Cheyenne-Elk (10120111)+, Upper Belle Fourche (10120201)+, Lower Belle Fourche (10120202)+, Redwater (10120203)+, Upper North Platte (10180002)+, Medicine Bow (10180004)+, Sweetwater (10180006)+, Middle North Platte-Casper (10180007)+, Glendo Reservoir (10180008)+*, Upper Laramie (10180010)+, Lower Laramie (10180011)+
14	Upper Dolores (14030002)+, Lower Dolores (14030004)+, Upper Colorado-Kane Springs (14030005)+, Upper Green (14040101)+, New Fork (14040102)+*, Big Sandy (14040104)+*, Upper Green-Flaming Gorge Reservoir (14040106)+, Blacks Fork (14040107)+, Muddy (14040108)+, Little Snake (14050003)+, Ashley-Brush (14060002)+, Duchesne (14060003)+, Upper Lake Powell (14070001)+, Fremont (14070003)+*, Escalante (14070005)+*, Chaco (14080106)+, Lower San Juan-Four Corners (14080201)+, Montezuma (14080203)+, Chinle (14080204)+
15	Upper Virgin (15010008)+*
16	Upper Bear (16010101)+, Central Bear (16010102)+, Bear Lake (16010201)+, Little Bear-Logan (16010203)+, Utah Lake (16020201)+*, Provo (16020203)+, Jordan (16020204)+, Upper Sevier (16030001)+*, East Fork Sevier (16030002)+, Middle Sevier (16030003)+, San Pitch (16030004)+*, Beaver Bottoms-Upper Beaver (16030007)+
17	Lower Kootenai (17010104)+, Pend Oreille Lake (17010214)+, Priest (17010215)+, Pend

	Oreille (17010216)*, Upper Coeur D'alene (17010301)+, Upper Spokane (17010305)+, Kettle (17020002)*, Sanpoil (17020004)*, Okanogan (17020006)*, Methow (17020008)*, Wenatchee (17020011)*, Upper Yakima (17030001)*, Naches (17030002)*, Snake headwaters (17040101)+, Gros Ventre (17040102)+, Greys-Hobock (17040103)+, Salt (17040105)+, Lower Henrys (17040203)+, Teton (17040204)+, Beaver-Camas (17040214)+, North and Middle Forks Boise (17050111)+, Lower Boise (17050114)+, North Fork Payette (17050123)+, Brownlee Reservoir (17050201)+, Powder (17050203)+, Hells Canyon (17060101)+, Imnaha (17060102)+, Upper Grande Ronde (17060104)+, Wallowa (17060105)+, Lower Grande Ronde (17060106)*, Upper Salmon (17060201)+, Upper Middle Fork Salmon (17060205)+, Middle Salmon-Chamberlain (17060207)+, South Fork Salmon (17060208)+, Lower Salmon (17060209)+, Little Salmon (17060210)+, Lochsa (17060303)+, South Fork Clearwater (17060305)+, North Fork John Day (17070202)+, Upper Deschutes (17070301)+, Little Deschutes (17070302)+, Mckenzie (17090004)+*, Coquille (17100305)+, Middle Rogue (17100308)+*, Fraser (17110001)*, Nooksack (17110004)*, Upper Skagit (17110005)*, Sauk (17110006)*, Puyallup (17110014)*, Nisqually (17110015)*
18	Upper Klamath (18010206)+*

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: A quiet, 22-cm-long woodpecker of boreal forests.
General Description: PLUMAGE: Adult male has a yellow crown, black forehead that is more or less spotted with dull white, black back and sides that are usually broadly barred with white, secondary feathers that are distinctly spotted with white and quills with white spots (Gabrielson and Lincoln 1959). The adult female is similar to the adult male but without any yellow on the head. The female's forehead and crown is usually spotted or streaked with grayish white but sometimes is completely black. Immatures are similar to adults. Young woodpeckers are naked and blind when hatched (Gabrielson and Lincoln 1959). CALLING BEHAVIOR: make tapping sounds while feeding. In the spring and summer you can hear courtship drumming. The call is a rattle similar to that of the hairy woodpecker (PICOIDES VILLOSUS) (Adams, pers. comm.) although the intervals between taps are longer at the beginning of calling episodes. The voice consists of a squeal resembling that of a small mammal and a short quap or quip (Gabrielson and Lincoln 1959).

NEST: Nesting habitat includes coniferous forests (with spruce, larch, or fir trees), or logged areas and swamps. Cavity nest dug by both sexes and are placed 1.5 to 15 m (5 to 50 feet) high in a stump or other dead or dying trees often near water. The entrance is about 4 centimeters by 5 centimeters (1 3/4 by 2 inches), and the cavity is about 25 to 38 centimeters (10 to 15 inches) deep (Oatman 1985).

EGGS: lie on beds of chips within the nest and are ovate, pure white, and only moderately glossy (Gabrielson and Lincoln 1959).
Diagnostic Characteristics: Morphologically very similar to the black-backed woodpecker (PICOIDES ARCTICUS) but is smaller. They are sympatric and occur together ecologically. The barred pattern on back distinguishes it from the black-backed.
Reproduction Comments: Nesting occurs in May and June, young can be found in the nest into July (Oatman 1985, Brewer et al. 1991, Adams pers. comm.). In Montana, nest building is observed in June, with the young out of the nest by early August (Davis 1961). One broods per year. Clutch size usually is four. Incubation, by both sexes, lasts 12-14 days. During incubation birds are rather quiet. Male roosts nightly in nest throughout incubation (Ehrlich et al. 1988). Young are tended by both parents, fledge in 22-26 days, remain with adults for at least a month after fledging. Nesting may be somewhat colonial where food is abundant. Pair bond sometimes lasts multiple years. Nesting times are very similar for the three-toed and black-backed woodpeckers.
Ecology Comments: IRRUPTIONS: Periodic irruptions occur, presumably due to a failure of the food supply. Sympatric with Black-backed Woodpecker (PICOIDES ARCTICUS) but irruptions do not coincide possibly due to difference in dependence on live and dead wood insects (Yunick 1985). Less likely to wander in the winter than the black-backed woodpecker. Interspecific competition may be reduced by taking advantage of different foraging heights and having differently sized bills (Peterson 1988).

Forest fire may lead to local increases in woodpecker populations 3-5 years after a fire (Spahr et al. 1991). In the northeastern U.S., territory size of 74 acres and density of 3 pairs per 247 acres (with increases after fire) have been recorded.

Non-Migrant: Y
Locally Migrant: N
Long Distance Migrant: N
Palustrine Habitat(s): FORESTED WETLAND, Riparian
Terrestrial Habitat(s): Forest - Conifer, Forest - Mixed, Woodland - Conifer, Woodland - Mixed
Special Habitat Factors: Standing snag/hollow tree
Habitat Comments: Coniferous forest (primarily spruce), less frequently mixed forest. Optimal habitat includes areas with 42-52 snags per 100 acres, with snags occurring in clumps, measuring 12-16 inches dbh and 20-40 feet tall, and mostly with bark still present (Spahr et al. 1991). Cavity nests placed in dead (occasionally live) tree (commonly conifer or aspen). Sometimes nests in utility poles.

Prefers coniferous forest, primarily spruce and balsam fir in the East. It inhabits areas where dead timber remains after fires or logging. It is found less frequently in mixed forest, and occasionally in willow thickets along streams. Also found in high elevation aspen groves, bogs, and swamps.

In the west, they occur in dense coniferous forests, and are associated with subalpine fir and Engelmann spruce at higher elevations; they occur mainly in lodgepole pine forests or in mixed-conifer forests with a lodgepole component at lower elevations (Short 1982). Seem to prefer disturbed coniferous forests with trees that exhibit thin, flaky bark such as spruce and lodgepole pine.

Adult Food Habits: Invertivore
Immature Food Habits: Invertivore
Food Comments: Eats mainly insects obtained by chipping off pieces of tree bark. Seventy-five percent of its diet consists of wood-boring beetles and caterpillars that attack dead or dying conifers (Oatman 1985). It eats a few ants, weevils, spiders, berries, acorns, cambium, and sap (Terres 1980). This woodpecker taps softly when feeding, and generally uses an angular bill motion to strip or flake bark pieces from conifers. In Vermont, birds have been seen tapping straight into the wood (Oatman 1985). Forages most often on dead (including fire-killed) trees.
Adult Phenology: Diurnal
Immature Phenology: Diurnal
Phenology Comments: Diurnal.
Length: 22 centimeters
Weight: 70 grams

Economic Attributes Expand

Management Summary Expand

Population/Occurrence Delineation Expand

Population/Occurrence Viability Expand

U.S. Invasive Species Impact Rank (I-Rank) Not yet assessed

Authors/Contributors Expand

References Expand

Use Guidelines & Citation Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

-->

Plebejus idas nabokovi - (Masters, 1972)
Nabokov's Blue
Synonym(s): *Lycaeides argyrognomon nabokovi* ;*Lycaeides idas nabokovi*
Taxonomic Status: Accepted
Related ITIS Name(s): *Plebejus idas nabokovi* (Masters, 1972) (TSN 778908)
Unique Identifier: ELEMENT_GLOBAL.2.120491
Element Code: IILEPG501B
Informal Taxonomy: Animals, Invertebrates - Insects - Butterflies and Moths - Butterflies and Skippers

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Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Mandibulata	Insecta	Lepidoptera	Lycaenidae	Plebejus

Check this box to expand all report sections: ☐

Concept Reference
Expand

Conservation Status
Collapse

NatureServe Status

Global Status: G5TU
Global Status Last Reviewed: 01Sep1998
Global Status Last Changed: 01Sep1998
Rounded Global Status: TU - Unrankable
Nation: United States
National Status: N1N3 (01Sep1998)
Nation: Canada
National Status: NNR

U.S. & Canada State/Province Status	
United States	Michigan (S2), Minnesota (S3), Wisconsin (SNR)
Canada	Manitoba (SNR)

Other Statuses

NatureServe Global Conservation Status Factors

Area of Occupancy:
Area of Occupancy Comments:

Viability/Integrity Comments:

Other NatureServe Conservation Status Information

Distribution

Collapse

U.S. States and Canadian Provinces

Map unavailable!:
Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.

U.S. & Canada State/Province Distribution	
United States	MI, MN, WI
Canada	MB

Range Map
No map available.

U.S. Distribution by County	
State	**County Name (FIPS Code)**
MI	Alger (26003), Dickinson (26043)*, Keweenaw (26083), Marquette (26103), Schoolcraft (26153)*
MN	Cook (27031), Lake (27075), St. Louis (27137)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
04	Baptism-Brule (04010101)+, Cloquet (04010202)+, Lake Superior (04020300)+*, Michigamme (04030107)+, Menominee (04030108)+*, Escanaba (04030110)+, Manistique (04060106)+
09	Rainy Headwaters (09030001)+, Vermilion (09030002)+

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Non-Migrant: N
Locally Migrant: N
Long Distance Migrant: N
Habitat Comments: See species account.

Economic Attributes

Not yet assessed

Management Summary

Not yet assessed

Population/Occurrence Delineation

Not yet assessed

Population/Occurrence Viability

Expand

U.S. Invasive Species Impact Rank (I-Rank)

Not yet assessed

Authors/Contributors

Expand

References

Expand

Use Guidelines & Citation

Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Pyrgus centaureae freija - (Warren, 1924)
Freija's Grizzled Skipper
Taxonomic Status: Accepted
Related ITIS Name(s): *Pyrgus centaureae freija* (B. Warren, 1924) (TSN 707410)
Unique Identifier: ELEMENT_GLOBAL.2.121224
Element Code: IILEP38011
Informal Taxonomy: Animals, Invertebrates - Insects - Butterflies and Moths - Butterflies and Skippers

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Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Mandibulata	Insecta	Lepidoptera	Hesperiidae	Pyrgus

Genus Size: C - Small genus (6-20 species)

Check this box to expand all report sections: ☐

Concept Reference
Expand

Conservation Status
Collapse

NatureServe Status

Global Status: G5T4T5
Global Status Last Reviewed: 30Sep1998
Global Status Last Changed: 30Sep1998
Rounded Global Status: T4 - Apparently Secure
Reasons: Globally this is not a rare subspecies. At least around 100 occurrences have actually been documented (seee Layberry et al, 1998; guppy and Shepard, 2001) and many more obviously exist. It is considered secure for example in Ontario (Holmes et al. (1991) and in British columbia (Guppy and Sheppard, 2001). While the subspecies is not rare in Canada or apparently in Alaska, it is of conservation concern in Minnesota where only one occurrence has been documented. it might also be of concern in at least portions of Quebec. The Michigan population which may or may not be this taxon is of conservation concern.
Nation: United States
National Status: NU (30Sep1998)
Nation: Canada
National Status: N4N5 (30Sep1998)

U.S. & Canada State/Province Status	
United	

States	Idaho (SNR), Minnesota (S3), Wyoming (SNR)
Canada	Alberta (S2S3), British Columbia (S5), Labrador (SNR), Manitoba (SNR), Northwest Territories (SNR), Ontario (S4), Quebec (S4S5), Saskatchewan (S5)

Other Statuses

NatureServe Global Conservation Status Factors

Range Extent: 200,000 to >2,500,000 square km (about 80,000 to >1,000,000 square miles)
Range Extent Comments: Mainly subarctic, but also low arctic and less widely in boreal forest regions. Nearly coast to coast in northern Canada then into Alaska, extending well southward through Ontario into northern Minnesota. It is possible populations in northern Michigan really belong in this taxon. Populations of the species in western USA should be referred to subspecies *loki.*

Area of Occupancy: Unknown 4-km2 grid cells
Area of Occupancy Comments:

Number of Occurrences: 81 to >300
Number of Occurrences Comments: Widespsread but somewhat local in subarctic Canada, known from about 20 places each even in Quebec and northern British Columiba on the peripheries of the range and many more probably are undisocovered in both provinces. Under 100 localities in Layberry et al (1998) appear referrable to this subspecies, but undoubtedly most populations are undiscovered in Canada and Alaska.

Population Size: 10,000 to >1,000,000 individuals

Number of Occurrences with Good Viability/Integrity: Many to very many (41 to >125) occurrences with good viability

Environmental Specificity: Moderate. Generalist or community with some key requirements scarce.
Environmental Specificity Comments: It does have specific but not well documented larval foodplant needs and some other habitat requirements, but overall is adaptable to a wide range of open boggy to dry natural and anthropogenic habitats.

Overall Threat Impact: Low
Overall Threat Impact Comments: Essentially unthreatened where habitats are permanent. such as most bog, alpine, tundra, and non-successional edaphic habitats occurrences. More threatened, or at least potentially threatened, southward in boreal forest openings, by such factors as succession, inappropriate natural, accidental, or prescribed fires, and probably budworm spraying. Michigan populations of this complex are seriously threatened by gypsy moth spraying which has pushed the related (possibly conspecific) *Pyrgus wyandot* close to extinction. It is less clear what impacts logging might have, both positive and negative. Some other disturbances in boreal forest settings probably benefit the species, in particular it could do rather well in right of ways and can ultilize old openings created by logging. According to Robert Dana the known Minnesota habitat was an area of past human disturbances including logging, an old saw mill and a railroad crossing.

Intrinsic Vulnerability: Not intrinsically vulnerable

Short-term Trend: Relatively stable (=10% change)

Long-term Trend: Increase of 10-25% to decline of 30%

Other NatureServe Conservation Status Information

Inventory Needs: Generally not a major priority in Canada but its current status in Minnesota is unknown and even its fooplant and precise habitat needs there are poorly known.

Protection Needs: See threats.

Distribution

Collapse

Global Range: (200,000 to >2,500,000 square km (about 80,000 to >1,000,000 square miles)) Mainly subarctic, but also low arctic and less widely in boreal forest regions. Nearly coast to coast in northern Canada then into Alaska, extending well southward through Ontario into northern Minnesota. It is possible populations in northern Michigan really belong in this taxon. Populations of the species in western USA should be referred to subspecies *loki.*

U.S. States and Canadian Provinces

Map unavailable!:
Distribution data for U.S. states and Canadian provinces is known to be incomplete or has not been reviewed for this taxon.

U.S. & Canada State/Province Distribution	
United States	ID, MN, WY
Canada	AB, BC, LB, MB, NT, ON, QC, SK

Range Map
No map available.

U.S. Distribution by County	
State	**County Name (FIPS Code)**
MN	Lake (27075)*

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
04	Cloquet (04010202)+*

\+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History — Collapse

Non-Migrant: N
Locally Migrant: N
Long Distance Migrant: N
Food Comments: According to Layberry *et al.* (1998) the documented larval foodplant for this subspecies is *Rubus chamaemorus* which is also used by the European subspecies. Since *Potentilla* species are used by the Rocky Mountain subspecies *loki* and by species or subspecies *wyandot* and *Fragaria* is the foodplant of the Michigan entity of this complex, these genera might or might not be foodplants fof *P. c. frieja*.

Economic Attributes — Not yet assessed

Management Summary — Expand

Population/Occurrence Delineation — Not yet assessed

Population/Occurrence Viability — Expand

U.S. Invasive Species Impact Rank (I-Rank) — Not yet assessed

Authors/Contributors — Expand

References — Expand

Use Guidelines & Citation — Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Somatochlora brevicincta - Robert, 1954
Quebec Emerald

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Search for Images on Google

Taxonomic Status: Accepted
Related ITIS Name(s): *Somatochlora brevicincta* Robert, 1954 (TSN 101964)
French Common Names: cordulie de Robert
Unique Identifier: ELEMENT_GLOBAL.2.107406
Element Code: IIODO32020
Informal Taxonomy: Animals, Invertebrates - Insects - Dragonflies and Damselflies

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Mandibulata	Insecta	Odonata	Corduliidae	Somatochlora

Genus Size: D - Medium to large genus (21+ species)

Check this box to expand all report sections: ☐

Concept Reference

Expand

Conservation Status

Collapse

NatureServe Status

Global Status: G4
Global Status Last Reviewed: 22Aug2006
Global Status Last Changed: 22Aug2006
Rounded Global Status: G4 - Apparently Secure
Reasons: More widespread than previously thought. The range of this species has been greatly extended into the Maritime Provinces and its habitat is not rare within this large range. It has also recently extended into the U.S.
Nation: United States
National Status: N2 (04Nov2004)
Nation: Canada
National Status: N3N4 (14Jan2012)

U.S. & Canada State/Province Status	
United States	Maine (S2), Minnesota (SNR)
Canada	British Columbia (S3), New Brunswick (S2), Newfoundland Island (SU), Nova Scotia (S1), Quebec (S3)

Other Statuses

IUCN Red List Category: LC - Least concern

NatureServe Global Conservation Status Factors

Range Extent: 20,000-2,500,000 square km (about 8000-1,000,000 square miles)
Range Extent Comments: Known from eastern Canada (Quebec, New Brunswick, Nova Scotia, Newfoundland), northern Maine, and a western population in British Columbia. Recently discovered in Minnesota.

Number of Occurrences: 6 - 20
Number of Occurrences Comments: Known from eastern Canada (Quebec, New Brunswick, Nova Scotia, Newfoundland), northern Maine, and a western population in British Columbia. Recently a breeding population was discovered in Minnesota in Lake Co. just south of the Canadian border (Tveekrem, 2006).

Population Size: 1000 - 2500 individuals

Overall Threat Impact Comments: Current threats appear minor over much of the species' range. Potential threats of habitat degradation are secondary impacts from harvesting of peatmoss and fuel peat, and cranberry farming, and primary impacts from broadcast toxic pollution, and water level alteration leading to inundation or dessication of the habitat.

Intrinsic Vulnerability Comments: Given the high vagility of the species (estimated 5 kilometers (3 miles) per day) and the prevalence of suitable habitat over much of its range, the species' overall population is not considered fragile. Localized extirpations would likely be re-inhabited very shortly (less than 2 years) after habitat recovery.

Short-term Trend: Relatively stable (=10% change)
Short-term Trend Comments: No abundance changes not attributable to flight season have been noted.

Other NatureServe Conservation Status Information

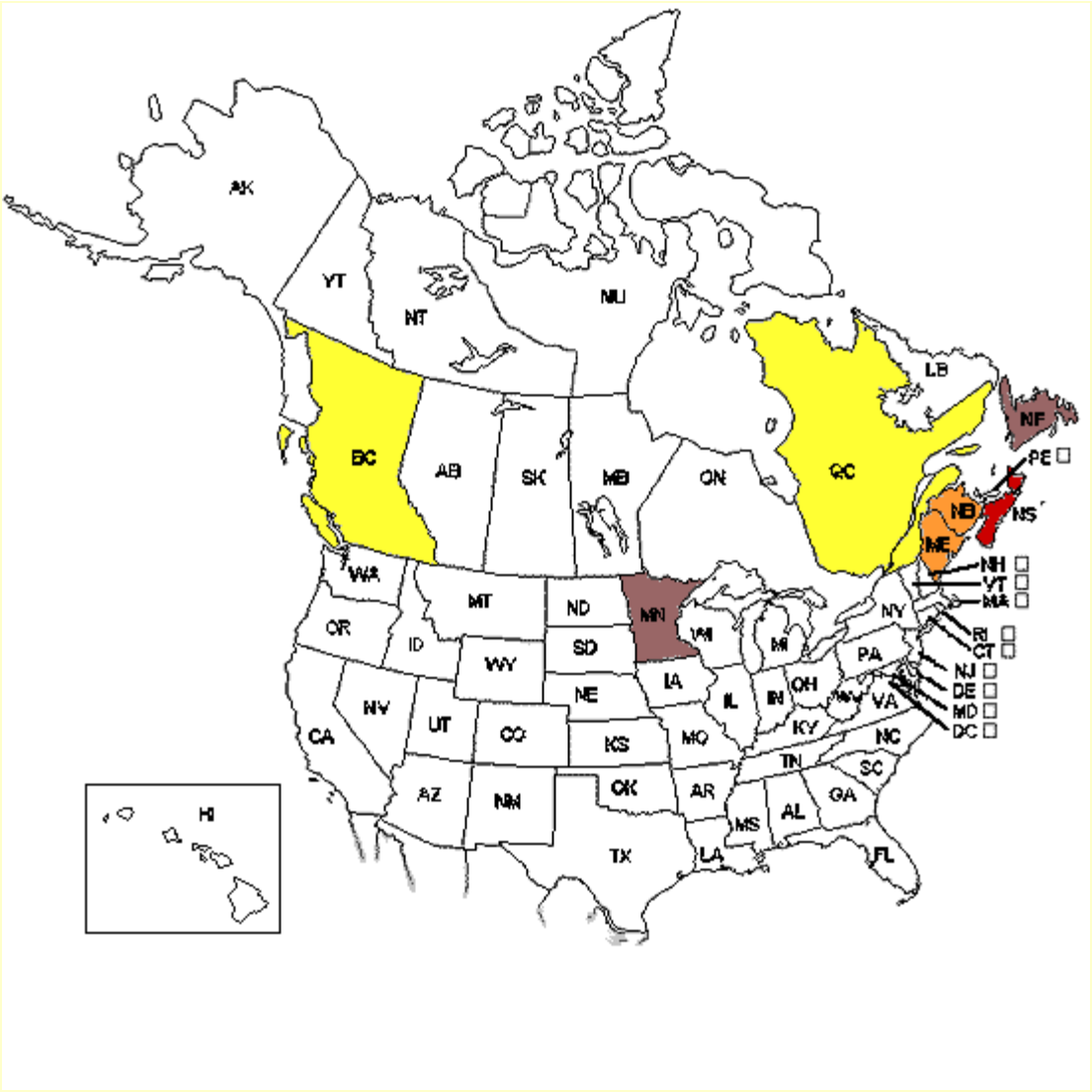
Inventory Needs: Survey for adults of the species within and peripheral to its current known range, Cape Breton Island (Nova Scotia) in the east, Maine and the rest of northern New England to the south as far as upstate New York. Also Michigan and Wisconsin.

Distribution

Collapse

Global Range: (20,000-2,500,000 square km (about 8000-1,000,000 square miles)) Known from eastern Canada (Quebec, New Brunswick, Nova Scotia, Newfoundland), northern Maine, and a western population in British Columbia. Recently discovered in Minnesota.

U.S. States and Canadian Provinces

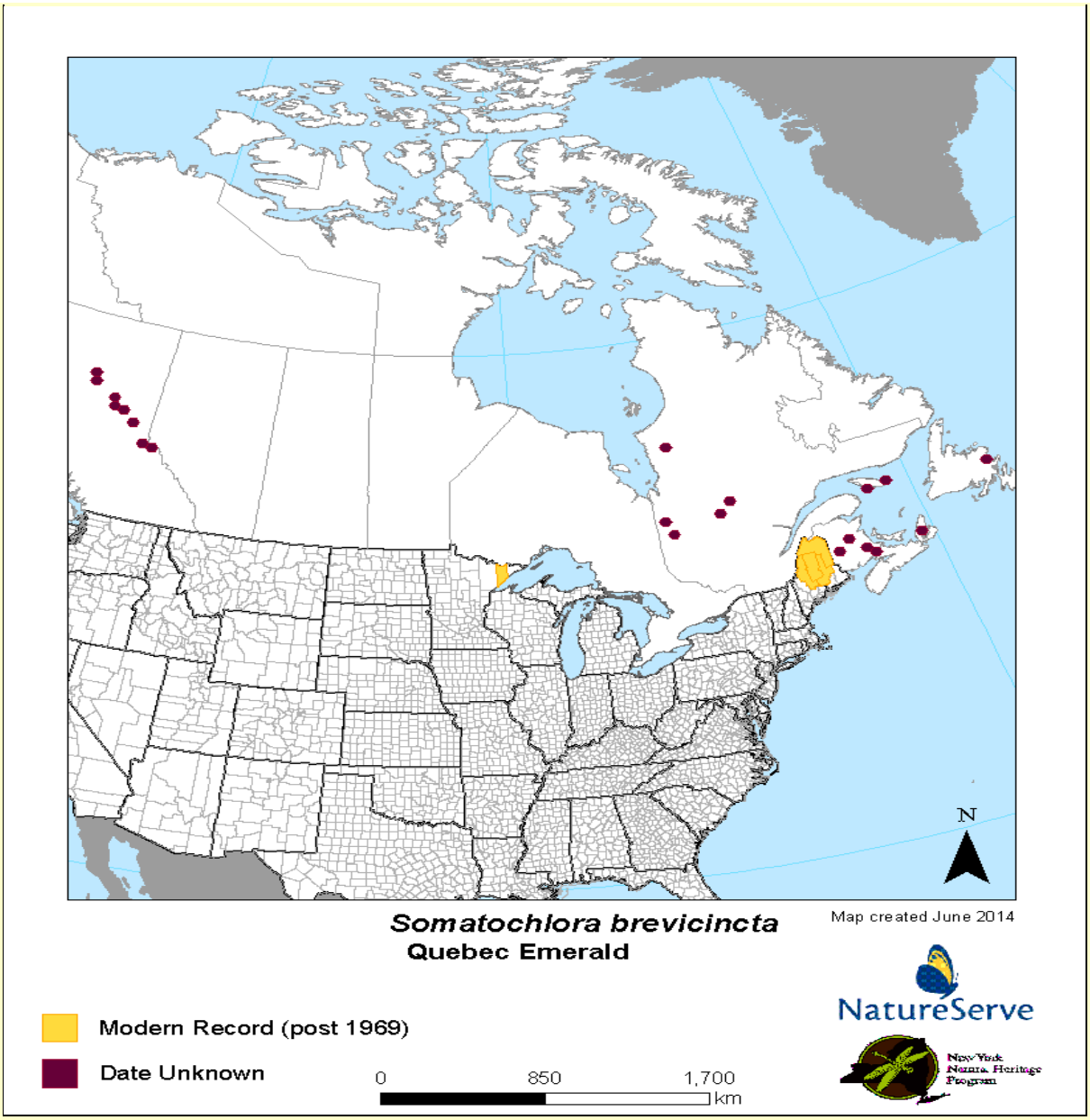


Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	ME, MN
Canada	BC, NB, NF, NS, QC

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: NatureServe

U.S. Distribution by County	
State	**County Name (FIPS Code)**
ME	Aroostook (23003), Penobscot (23019), Piscataquis (23021), Somerset (23025)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed	
Watershed Region	**Watershed Name (Watershed Code)**
01	Upper St. John (01010001)+, Allagash (01010002)+, West Branch Penobscot (01020001)+, East Branch Penobscot (01020002)+, Mattawamkeag (01020003)+, Lower Penobscot (01020005)+, Upper Kennebec (01030001)+

\+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: A moderate sized dragonfly, its thorax metallic green with one lateral light stripe, the dorsal abdomen black.
General Description: Metallic brown with eyes bright green in life. Larva unknown.
Diagnostic Characteristics: Very like S. ALBICINTA, but male hamule curved and not bent, male cerci with 1 lateral angle at base instead of 2, female subgenital plate as long as abdominal segment 9 and not notched (1/2 as long and notched in ALBICINTA). (Walker & Corbet, 1975)
Non-Migrant: N
Locally Migrant: N
Long Distance Migrant: N
Palustrine Habitat(s): Bog/fen
Habitat Comments: Lentic. Habitat is predominantly bogs, fens, and heaths.

The microhabitat (sub-EO) is water-suspended or water-saturated SPHAGNUM ("quaking bog" and "moss lawn") whether or not associated with open water, and typically showing graminaceous emergents indicating weak minerotrophism.

Eggs are laid outside plant tissues on the moss or adjacent water surface, with the larvae likely living within the saturated moss itself rather than on its interface with open water. The species has not been observed at open-water peatland ponds. Landforms in which the habitat can develop will generally be of bedrock or surficial deposits with little mineralizing potential and be of some relief as the habitat is dependent for its weak mineralization upon short or isolated catchments. However these habitats may also form adjacent to or within peat bogs or heaths which can form in low relief areas.
Adult Food Habits: Invertivore
Immature Food Habits: Invertivore
Adult Phenology: Diurnal
Phenology Comments: Larvae must overwinter, life cycle probably at least 2 years, flight season mid July to early September.
Length: 5 centimeters

Economic Attributes

Not yet assessed

Management Summary

Expand

Population/Occurrence Delineation

Expand

Population/Occurrence Viability

Expand

U.S. Invasive Species Impact Rank (I-Rank)

Not yet assessed

Authors/Contributors

Expand

References

Expand

Use Guidelines & Citation

Expand

Version 7.1 (2 February 2009)
Data last updated: March 2014

Strix nebulosa - Forster, 1772
Great Gray Owl
Other English Common Names: Great Grey Owl
Taxonomic Status: Accepted
Related ITIS Name(s): *Strix nebulosa* J. R. Forster, 1772 (TSN 177929)
French Common Names: chouette lapone
Unique Identifier: ELEMENT_GLOBAL.2.100756
Element Code: ABNSB12040
Informal Taxonomy: Animals, Vertebrates - Birds - Other Birds

Kingdom	Phylum	Class	Order	Family	Genus
Animalia	Craniata	Aves	Strigiformes	Strigidae	Strix

Genus Size: C - Small genus (6-20 species)

Check this box to expand all report sections: ☐

Concept Reference
Expand

Conservation Status
Collapse

NatureServe Status

Global Status: G5
Global Status Last Reviewed: 27Nov1996
Global Status Last Changed: 27Nov1996
Rounded Global Status: G5 - Secure
Reasons: Large circumboreal range; no decline is evident in the vast majority of the range, but few data are available for most areas.
Nation: United States
National Status: N4 (05Jan1997)
Nation: Canada
National Status: N5 (13Feb2012)

U.S. & Canada State/Province Status	
United States	Alaska (S4), California (S1), Idaho (S3), Maine (S1S2N), Michigan (SNRN), Minnesota (SNR), Montana (S3), New York (SNRN), Oregon (S3), Utah (S1N), Washington (S2B), Wyoming (S2)

Canada	Alberta (S4), British Columbia (S4B), Manitoba (S4B), Northwest Territories (S5), Ontario (S4), Quebec (S3S4), Saskatchewan (S3B,S3N), Yukon Territory (S4)

Other Statuses

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Not at Risk (01Apr1996)
IUCN Red List Category: LC - Least concern
Convention on International Trade in Endangered Species Protection Status (CITES): Appendix II

NatureServe Global Conservation Status Factors

Range Extent Comments: BREEDS: central Alaska to northern Ontario, south locally in mountains to California (vicinity of Yosemite), Idaho, Montana, Wyoming, central Saskatchewan, northern Minnesota, and south-central Ontario. WINTERS: generally throughout breeding range, wandering south irregularly to northern U.S. Also in Old World. Usually uncommon, but sometimes may be locally abundant.

Population Size: 10,000 to >1,000,000 individuals
Population Size Comments: Guesstimated number of breeding pairs in Canada in the early 1990s was 10,000-25,000 (Kirk et al. 1995). See Johnsgard (1988) for listing of recent status studies in Manitoba, Saskatchewan, California (about 10 breeding pairs, California Department of Fish and Game 1990), Wyoming, Idaho, and Oregon.

Overall Threat Impact Comments: In California, habitat loss through logging of mature forest and overgrazing of meadows has been the primary cause for decline (California Department of Fish and Game 1990).

Short-term Trend Comments: No evident population decline in the vast majority of the range; apparently stable, but actual population data are lacking for many areas (Nero, 1979 COSEWIC report; Kirk et al. 1995).

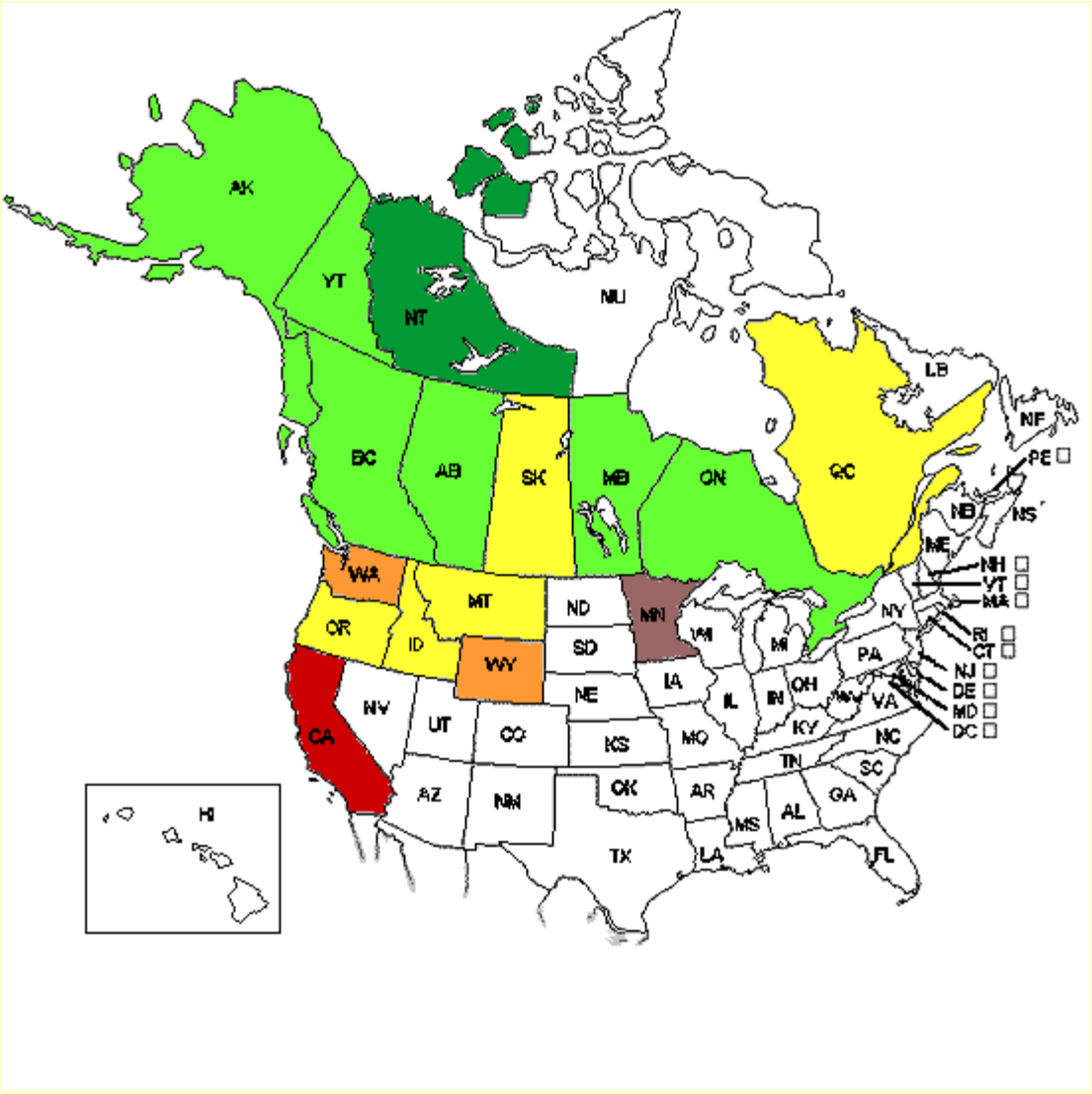
Other NatureServe Conservation Status Information

Distribution

Collapse

Global Range: BREEDS: central Alaska to northern Ontario, south locally in mountains to California (vicinity of Yosemite), Idaho, Montana, Wyoming, central Saskatchewan, northern Minnesota, and south-central Ontario. WINTERS: generally throughout breeding range, wandering south irregularly to northern U.S. Also in Old World. Usually uncommon, but sometimes may be locally abundant.

U.S. States and Canadian Provinces



State/Province Conservation Status

- SX: Presumed Extirpated
- SH: Possibly Extirpated
- S1: Critically Imperiled
- S2: Imperiled
- S3: Vulnerable
- S4: Apparently Secure
- S5: Secure
- Not Ranked/Under Review (SNR/SU)

Conservation Status Not Applicable (SNA)

- Exotic
- Hybrid without Conservation Value

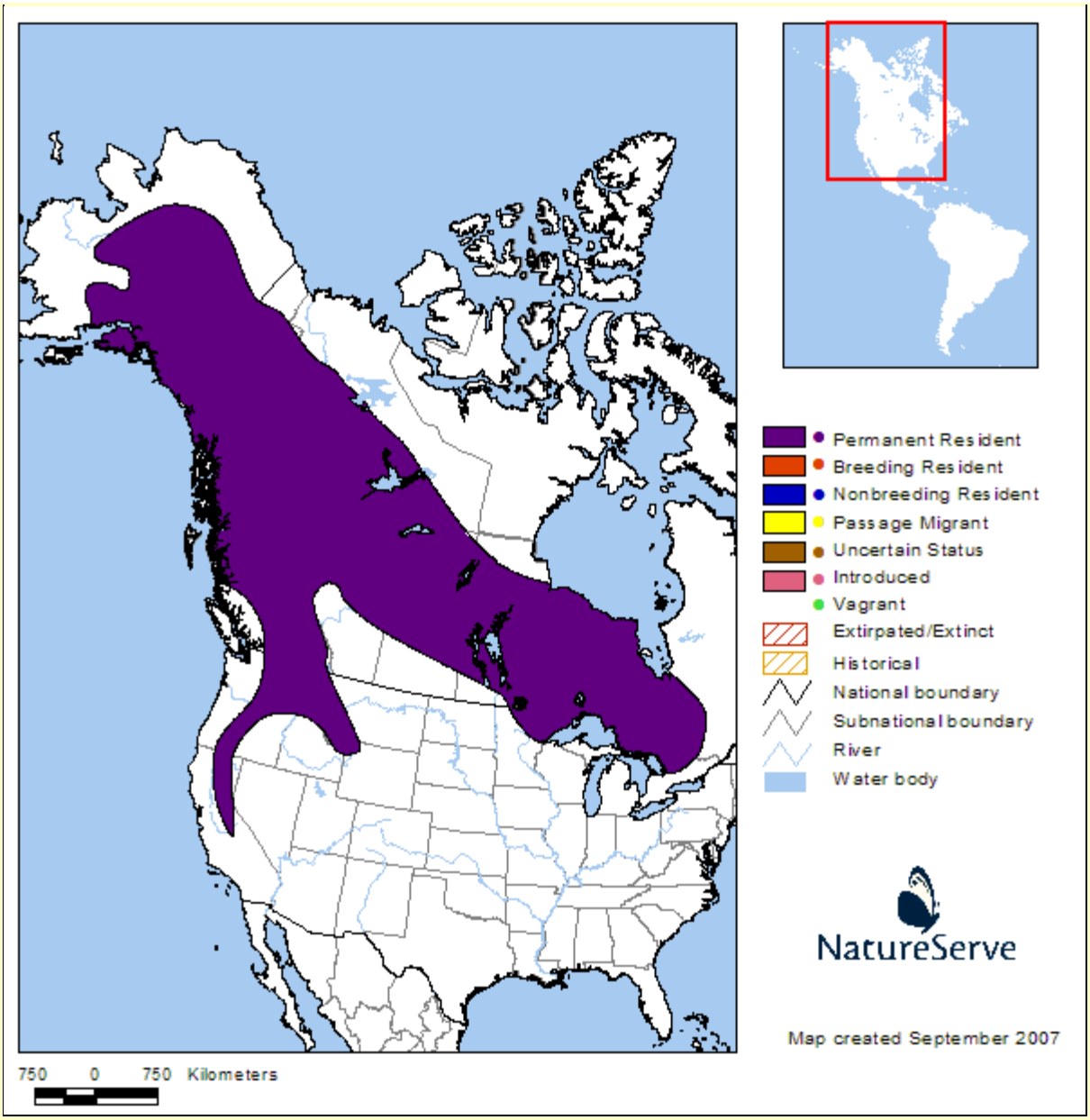
NOTE: The maps for birds represent the breeding status by state and province. In some jurisdictions, the subnational statuses for common species have not been assessed and the status is shown as not-assessed (SNR). In some jurisdictions, the subnational status refers to the status as a non-breeder; these errors will be corrected in future versions of these maps. A species is not shown in a jurisdiction if it is not known to breed in the jurisdiction or if it occurs only accidentally or casually in the jurisdiction. Thus, the species may occur in a jurisdiction as a seasonal non-breeding resident or as a migratory transient but this will not be indicated on these maps. See other maps on this web site that depict the Western Hemisphere ranges of these species at all seasons of the year.

Endemism: occurs (regularly, as a native taxon) in multiple nations

U.S. & Canada State/Province Distribution	
United States	AK, CA, ID, ME, MI, MN, MT, NY, OR, UT, WA, WY
Canada	AB, BC, MB, NT, ON, QC, SK, YT

Range Map

Note: Range depicted for New World only. The scale of the maps may cause narrow coastal ranges or ranges on small islands not to appear. Not all vagrant or small disjunct occurrences are depicted. For migratory birds, some individuals occur outside of the passage migrant range depicted. A shapefile of this map is available for download at www.natureserve.org/conservation-tools/data-maps-tools.



Range Map Compilers: WILDSPACETM 2002

U.S. Distribution by County	
State	**County Name (FIPS Code)**
CA	Alpine (06003)*, El Dorado (06017), Fresno (06019), Lassen (06035)*, Madera (06039), Mariposa (06043), Modoc (06049)*, Mono (06051)*, Plumas (06063), Sierra (06091)*, Siskiyou (06093), Tulare (06107), Tuolumne (06109), Yuba (06115)
ID	Ada (16001)*, Adams (16003), Bannock (16005)*, Bear Lake (16007), Benewah (16009), Boise (16015), Bonner (16017), Bonneville (16019), Boundary (16021), Butte (16023), Caribou (16029), Clark (16033), Clearwater (16035), Custer (16037), Franklin (16041), Fremont (16043), Idaho (16049), Jefferson (16051)*, Kootenai (16055), Latah (16057), Lemhi (16059), Lewis (16061), Lincoln (16063), Madison (16065), Minidoka (16067), Nez Perce (16069), Shoshone (16079), Teton (16081), Twin Falls (16083), Valley (16085), Washington (16087)
MN	Aitkin (27001)*, Carlton (27017), Cass (27021), Cook (27031), Itasca (27061), Lake (27075), Roseau (27135), St. Louis (27137)
MT	Beaverhead (30001), Carbon (30009), Deer Lodge (30023), Flathead (30029), Gallatin (30031), Granite (30039), Judith Basin (30045), Lake (30047), Lincoln (30053), Meagher (30059), Missoula (30063), Park (30067), Powell (30077), Ravalli (30081), Silver Bow (30093), Teton (30099), Wheatland (30107)

OR	Josephine (41033)
UT	Wasatch (49051)
WA	Asotin (53003)+*, Chelan (53007)+*, Columbia (53013)+*, Cowlitz (53015)+*, Ferry (53019)+*, Jefferson (53031)+*, King (53033)+*, Kittitas (53037)+*, Lewis (53041)+*, Okanogan (53047)+*, Pend Oreille (53051)+*, Skagit (53057)+*, Skamania (53059)+*, Snohomish (53061)+*, Spokane (53063)+*, Stevens (53065)+*, Thurston (53067)+*, Whatcom (53073)+*, Whitman (53075)+*, Yakima (53077)+*
WY	Crook (56011), Fremont (56013), Lincoln (56023), Park (56029), Sublette (56035), Teton (56039), Weston (56045)

* Extirpated/possibly extirpated

U.S. Distribution by Watershed

Watershed Region	Watershed Name (Watershed Code)
04	Baptism-Brule (04010101)+, St. Louis (04010201)+, Cloquet (04010202)+
07	Mississippi Headwaters (07010101)+, Leech Lake (07010102)+, Elk-Nokasippi (07010104)+*
09	Roseau (09020314)+, Rainy Headwaters (09030001)+
10	Red Rock (10020001)+, Beaverhead (10020002)+, Big Hole (10020004)+, Gallatin (10020008)+, Upper Missouri (10030101)+, Teton (10030205)+, Judith (10040103)+, Upper Musselshell (10040201)+, Yellowstone Headwaters (10070001)+, Shields (10070003)+, Stillwater (10070005)+, Clarks Fork Yellowstone (10070006)+, Upper Wind (10080001)+, Popo Agie (10080003)+, North Fork Shoshone (10080012)+, Upper Cheyenne (10120103)+, Upper Belle Fourche (10120201)+
14	Upper Green (14040101)+, New Fork (14040102)+, Duchesne (14060003)+
16	Bear Lake (16010201)+, Little Bear-Logan (16010203)+, Provo (16020203)+, Upper Carson (16050201)+*, West Walker (16050302)+*
17	Fisher (17010102)+, Lower Kootenai (17010104)+, Upper Clark Fork (17010201)+, Flint-Rock (17010202)+, Blackfoot (17010203)+, Bitterroot (17010205)+, North Fork Flathead (17010206)+, Flathead Lake (17010208)+, Lower Flathead (17010212)+, Pend Oreille Lake (17010214)+, Priest (17010215)+, Pend Oreille (17010216)*, St. Joe (17010304)+, Upper Spokane (17010305)+, Franklin D. Roosevelt Lake (17020001)*, Kettle (17020002)*, Colville (17020003)*, Sanpoil (17020004)*, Chief Joseph (17020005)*, Okanogan (17020006)*, Similkameen (17020007)*, Methow (17020008)*, Upper Columbia-Entiat (17020010)*, Wenatchee (17020011)*, Upper Yakima (17030001)*, Snake headwaters (17040101)+, Gros Ventre (17040102)+, Greys-Hobock (17040103)+, Palisades (17040104)+, Salt (17040105)+, Idaho Falls (17040201)+, Upper Henrys (17040202)+, Lower Henrys (17040203)+, Teton (17040204)+, Willow (17040205)+, Blackfoot (17040207)+, Portneuf (17040208)+*, Lake Walcott (17040209)+, Upper Snake-Rock (17040212)+, Beaver-Camas (17040214)+, Medicine Lodge (17040215)+, Birch (17040216)+, Big Wood (17040219)+, North and Middle Forks Boise (17050111)+, Boise-Mores (17050112)+*, North Fork Payette (17050123)+, Weiser (17050124)+, Brownlee Reservoir (17050201)+, Lower Snake-Asotin (17060103)+, Lower Snake-Tucannon (17060107)*, Palouse (17060108)+, Rock (17060109)*, Upper Salmon (17060201)+, Middle Salmon-Panther (17060203)+, Lemhi (17060204)+, Upper Middle Fork Salmon (17060205)+, Lower Middle Fork Salmon (17060206)+, Middle Salmon-Chamberlain (17060207)+, South Fork Salmon (17060208)+, Lower Salmon (17060209)+, Little Salmon (17060210)+, Lochsa (17060303)+, South Fork Clearwater (17060305)+, Clearwater (17060306)+, Walla Walla (17070102)*, Lower Columbia-Sandy (17080001)*, Lewis (17080002)*, Upper Cowlitz (17080004)*, Lower Cowlitz (17080005)*, Queets-Quinault (17100102)*, Middle Rogue (17100308)+, Applegate (17100309)+, Lower Rogue (17100310)+, Fraser (17110001)*, Upper Skagit (17110005)*, Sauk (17110006)*, Lower Skagit (17110007)*, Stillaguamish (17110008)*, Skykomish (17110009)*, Snoqualmie (17110010)*, Duwamish (17110013)*, Puget Sound (17110019)*
18	Upper Klamath (18010206)+, Upper Pit (18020002)+*, Middle Fork Feather (18020123)+, Upper Yuba (18020125)+, South Fork American (18020129)+*, South Fork Kern (18030002)+, Upper Kaweah (18030007)+*, Upper King (18030010)+, Tulare-Buena Vista Lakes (18030012)+, Upper San Joaquin (18040006)+, Upper Merced (18040008)+, Upper Tuolumne (18040009)+, Upper Stanislaus (18040010)+, Upper Cosumnes (18040013)+, Crowley Lake (18090102)+*

+ Natural heritage record(s) exist for this watershed
* Extirpated/possibly extirpated

Ecology & Life History

Collapse

Basic Description: A very large owl.
Reproduction Comments: Egg dates: late March-May in Alberta, late April-early June in Ontario, peak mid-April to late May in California, mean date of first egg 5 May in southern Idaho and northwestern Wyoming; eggs laying may be delayed in years with deep snow (Franklin 1988). Clutch size is 2-5 (usually 2-3 or 3-4). Incubation lasts 28-29 days, by female (male brings food). Young begin to leave nest at 3-4 weeks (4 weeks in Idaho/Wyoming), fly well at 5-6 weeks (6 weeks in Idaho/Wyoming), independent at about 4-5 months (Idaho/Wyoming: Franklin 1988). Usually first breeds at 3-4 years. Pair bond is not maintained outside breeding season, but bond may reform if both birds return to the same breeding territory. Some pairs may not breed in years of low prey abundance.
Ecology Comments: Some may remain on breeding territory all year; others may move irregularly in search of favorable foraging conditions. In Oregon, radio-tagged juveniles moved 9-31 km from nest over period of 1 year, adults moved 3-43 km during same period (see Johnsgard 1988). Predation by great horned owl was greatest known mortality factor in northern Minnesota and southeastern Manitoba (Duncan 1987).
Non-Migrant: Y
Locally Migrant: N
Long Distance Migrant: N
Mobility and Migration Comments: Greater mobility exhibited in years when food scarce (Duncan 1987). Food scarcity or unavailability may cause post-breeding movement upslope and downslope movement in winter (California Department of Fish and Game 1990). May move several hundred km southward for winter; in some areas, longest movements made by immatures (but see ECOLCOM).
Palustrine Habitat(s): Bog/fen, Riparian
Terrestrial Habitat(s): Forest - Conifer, Forest - Hardwood, Forest - Mixed, Grassland/herbaceous, Woodland - Conifer, Woodland - Hardwood, Woodland - Mixed
Special Habitat Factors: Standing snag/hollow tree
Habitat Comments: Dense coniferous and hardwood forest, especially pine, spruce, paper birch, poplar; also second growth, especially near water, foraging in wet meadows; boreal forest and spruce-tamarack bogs in far north, coniferous forest and meadows in mountains.

Nests in top of large broken-off tree trunks (especially in south), in old nests of other large birds (e.g., hawk nest) (especially in north), or in debris platforms from dwarf mistletoe; frequently near bogs or clearings. Nests frequently reused (Franklin 1988). Same pair often nests in same area in successive years.
Adult Food Habits: Carnivore
Immature Food Habits: Carnivore
Food Comments: Diet in North America dominated by pocket gophers and voles. Forages usually in open area where scattered trees or forest margin provides suitable sites for visual searching; also uses sound to locate prey under snow cover.
Adult Phenology: Circadian
Immature Phenology: Circadian
Phenology Comments: In winter, hunts primarily in early morning and from late afternoon until dusk. When nesting, may hunt day or night.
Length: 69 centimeters
Weight: 1298 grams

Economic Attributes

Not yet assessed

Management Summary

Expand

Population/Occurrence Delineation

Expand

Population/Occurrence Viability

Expand

U.S. Invasive Species Impact Rank (I-Rank)

Not yet assessed

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References

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Use Guidelines & Citation

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