The IUCN Red List of Threatened Species™
ISSN 2307-8235 (online)
IUCN 2008: T12521A50655874
Scope: Global
Language: English

Lynx rufus, Bobcat

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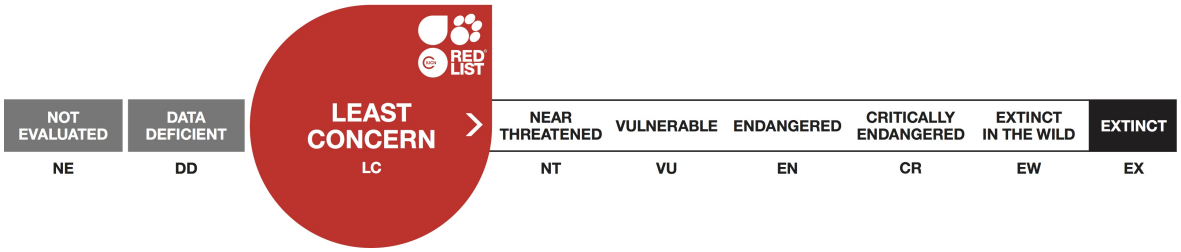

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Citation: Kelly, M., Morin, D. & Lopez-Gonzalez, C.A. 2016. *Lynx rufus. The IUCN Red List of Threatened Species 2016*: e.T12521A50655874. http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T12521A50655874.en

Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Carnivora	Felidae

Taxon Name: *Lynx rufus* (Schreber, 1777)

Common Name(s):

- English: Bobcat, Bay Lynx
- French: Chat sauvage, Lynx roux
- Spanish: Gato Montés, Lince, Lince Rojo

Taxonomic Notes:

Taxonomy is currently under review by the IUCN SSC Cat Specialist Group (2014). Placed in *Lynx* according to genetic analysis (Johnson *et al.* 2006).

Assessment Information

Red List Category & Criteria: Least Concern ver 3.1

Year Published: 2016

Date Assessed: February 11, 2016

Justification:

The Bobcat is listed as Least Concern because it is abundant and wide-ranging and is not suspected to be declining at a rate that would qualify it for Near Threatened. Bobcats are widely-distributed and their current range consists of most of the United States, southern Canada, and Mexico where the state of Oaxaca remains the southern-most limit for the species. However, local threats may present challenges for long term persistence in some regions including market hunting for the fur trade, direct habitat loss caused by increased urbanization, and indirect effects of urbanization such as genetic isolation and lethal/sublethal exposure to anticoagulant rodenticides (southern California). Florida is the only US state to report Bobcat declines with Bobcat observations decreasing dramatically as invasive pythons have increased in the southern part of the state. Additionally, some concern exists about sustainability of current bag limits with the increasing value of Bobcat pelts (West Virginia). Other local threats include possible disease transmission (canine distemper in Bobcats in eastern Canada), direct conflict with domestic/feral animals including feral dogs (northern Mexico), and poisoning and medicinal uses of Bobcats (central and southern Mexico). Bobcat densities are low in central and southern, compared to northern, Mexico. The recent discovery of hybridization between the Bobcat and the sympatric Canadian Lynx may result in conservation actions for the endangered lynx recovery.

Previously Published Red List Assessments

2008 – Least Concern (LC)
http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T12521A3352506.en

2002 – Least Concern (LC)

1996 – Lower Risk/least concern (LR/lc)

http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T12521A50655874.en

Geographic Range

Range Description:

Bobcats occur in southern Canada and throughout the United States and Mexico. In Canada, Bobcats appear to be extending their range northward as forest clearing occurs (Nowell and Jackson 1996, Sunquist and Sunquist 2002). Recent confirmation of Bobcats via remote camera, suggests Bobcat range extends further into the Canadian Rocky Mountains than previously thought (Lobo and Millar 2010). In the United States, bobcats were thought to be extirpated by the early 1900s from several Midwestern states including Iowa, Illinois, Indiana, Ohio, and Missouri, due to habitat loss and exploitation (Lariviére and Walton 1997), but they have recently recolonized these areas (Roberts and Crimmins 2010). Bobcats now occur in all contiguous United States except Delaware. Bobcats are found throughout Mexico, particularly in western Mexico and southward from the Sonoran desert. Competitive interactions with ecologically similar felids could be a factor in limiting their southern distribution, but similar competitors are present in other areas of Mexico (Sanchez-Cordero *et al.* 2008). Thus, the absence of *Lynx rufus* below the Isthmus of Tehuantepec may be due to the absence of prey species. However, confirmative data of Bobcat presence throughout Mexico is somewhat scanty. While Bobcat range is thought to stop at the Isthmus of Tehuantepec in southern Mexico (Sanchez-Cordero *et al.* 2008, Gonzalez-Salazar *et al.* 2013), this is based on habitat modeling rather than verified confirmations. While generally favoring low and mid-elevations, in the western US, Bobcat have been trapped at elevations up to 2,575 m (Nowell and Jackson 1996). In Mexico, radio-collared Bobcats were located at 3,500 m on the Colima Volcano in western Mexico (Burton *et al.* 2003).

Country Occurrence:

Native: Canada (Alberta, British Columbia, Manitoba, New Brunswick, Nova Scotia, Ontario, Prince Edward I., Québec, Saskatchewan); Mexico (Baja California, Baja California Sur, Chihuahua, Coahuila, Durango, Guanajuato, Guerrero, Hidalgo, Jalisco, México Distrito Federal, México State, Michoacán, Morelos, Nayarit, Nuevo León, Oaxaca, Puebla, Querétaro, San Luis Potosí, Sinaloa, Sonora, Tamaulipas, Tlaxcala, Veracruz); United States (Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming)

http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T12521A50655874.en

Population

In 2010, Roberts and Crimmins surveyed state wildlife management agencies in each of the 48 contiguous states regarding the current population status of Bobcats. Populations were reported to be stable or increasing in 40 states, with six states unable to report population trends and only one state (Florida) reporting decreases in Bobcat populations. The total Bobcat population for the US is estimated to be between 2,352,276 to 3,571,681 individuals, indicating that Bobcat populations have increased throughout the majority of their range in North America since the late 1990s. In particular, Bobcat populations have rebounded in the Midwestern states in recent decades. Bobcats now occur in all contiguous United States except Delaware. Five Canadian provinces reported stable Bobcat populations, one reported a stable or increasing population, and one reported a fluctuating population. Bobcat population sizes and status in Mexico are not well known.

Despite being widespread, there are only a few estimates for the densities that bobcats can attain. Density estimates include: 57-62 / 100km² in California (Alonso *et al.* 2015), 48/100 km² in Texas (Heilbrun *et al.* 2006), 25/100 km² in Arizona (Lawhead 1984), <9/100 km² in Idaho (Knick 1990), and 11/100 km² in Virginia (minimum estimate, M. Kelly and D. Morin pers. comm. 2015). Bobcat densities in the northern parts of their range are generally lower than in the south (Sunquist and Sunquist 2002). A density estimate for Bobcats in Mexico was low, at five individuals per 100 km² (Arzate *et al.* 2007). Bobcat densities can vary dramatically depending on site and Thornton and Perkins (2015) found that densities in Texas were lowest in the most heavily modified landscape, and that Bobcat capture probability was positively related to forest cover.

Current Population Trend: Stable

Habitat and Ecology **(see Appendix for additional information)**

In the US, the Bobcat ranges through a wide variety of habitats, including boreal coniferous and mixed forests in the north, bottomland hardwood forest and coastal swamp in the southeast, and desert and scrubland in the southwest. Only large, intensively cultivated areas appear to be unsuitable habitat. Areas with dense understory vegetation and high prey density are most intensively selected by Bobcats (Nowell and Jackson 1996). The requisite features of Bobcat habitat typically include areas with abundant rabbit and rodent populations, dense cover, and shelters that function as escape cover or den sites (Sunquist and Sunquist 2002). In Mexico, Bobcats are found in dry scrub and grassland, as well as tropical dry forest including pine, oak and fir (Monroy-Vilchis and Velazquez 2003, Arzate *et al.* 2007, C. Lopez-Gonzalez pers. comm. 2007).

Like its close relative *Lynx canadensis* the Bobcat preys primarily on lagomorphs (rabbits), but is much less of a specialist. Rodents are commonly taken, and Bobcats are capable of taking larger prey, including young ungulates (Nowell and Jackson 1996, Sunquist and Sunquist 2002). A study in Virginia found Bobcats preyed on a wide variety of species (15 total) including squirrels, chipmunks, white-tailed deer, voles, and rabbits, appearing to switch prey seasonally as certain prey items became more available (Montague 2014, Morin *et al.* in review).

Bobcats in New Hampshire appear to favour areas with few roads, limited human development, high stream densities, and steep topography (Broman *et al.* 2014). Similarly, Bobcats in Vermont have positive responses to shrub, wetland, deciduous, and coniferous cover types, and negative responses to

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road and mixed cover types, and Bobcats prefer to move through forested land and scrub/rock cover rather than move through developed land cover types (Donovan *et al.* 2011). The recently re-established Bobcats in Iowa showed a strong preference for forest over any other habitat type (Reding *et al.* 2013, Tucker *et al.* 2008). In Virginia, Bobcats were also shown to occur more often father away from roads (Kelly and Holub 2008). So while Bobcats can adjust to some levels of human encroachment, studies support the preference of Bobcats for vegetative cover and water in areas away from roads. Bobcat populations have been shown to decline in areas where forests have matured and no longer support abundant prey, namely cottontails (Litvaitis *et al.* 2006). Additionally, in Texas, when in the presence of Ocelots, Bobcats selected areas with <75% canopy cover, likely facilitating coexistence between the two predators and demonstrating the Bobcat's flexibility in habitat selection (Horne *et al.* 2009). Alternatively, another study has shown the Bobcat will expand its use of different environmental features and use of marginal habitat in the presence of Canada Lynx (Peers *et al.* 2013).

Ferguson *et al.* (2009) gathered home range information from 29 Bobcat populations across the US and found that on average, males maintained home ranges 1.65 times the size of females. Female home ranges were 0.989–42.7 km² with a mean of 15.83 km² compared to male home ranges of 2.86– 167.9 km² with a mean of 39.70 km². Females demonstrated a strong positive association between home-range size and productivity (i.e. food availability), whereas males were influenced more by changes in size of female home ranges than by resource availability (Ferguson *et al.* 2009, Sandell 1989).

Systems: Terrestrial

Use and Trade

For information on use and trade , see under Threats.

Threats **(see Appendix for additional information)**

World demand for Bobcat fur rose gradually in the late 1960s and early 1970s and jumped in the mid-1970s after CITES entered into force, when the pelts of cats listed on Appendix I became legally unobtainable for the commercial fur trade (Nowell and Jackson 1996). Of particular and concern is the recent increase in Bobcat pelt prices from $85 in 2000, to record highs of $589 in 2013, $447 in 2014, and $305 in 2015, driven by high demand for fur in China, Europe, and Russia (Knudson 2016). The number of Bobcat pelts exported from the U.S. has quadrupled in recent years, climbing to a high of 65,000 in 2013 when pelt prices were highest.

The US government has found that trade is not detrimental to Bobcat survival and is well-managed by state authorities. They have petitioned CITES numerous times, most recently in 2007, to remove the Bobcat from the CITES Appendices, arguing that the Bobcat does not meet the biological criteria for CITES listing and that their research indicates that importing governments should be able to reliably distinguish Bobcat skins from other species to prevent illegal trade (Govt of US 2007). However, the proposal was rejected by majority vote of the Parties to CITES (Nowell *et al.* 2007).

Habitat loss is viewed as another primary threat to bobcats in all three range countries. Increasing urbanization results in direct habitat loss when human density is high, although Bobcats have proven to be fairly adaptive to urbanization (Ordenana *et al.* 2010, Tracey *et al.* 2013) and low density developments (one house per two acres), particularly in areas with landscaped green spaces and golf

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courses, and Bobcats have been documented denning and raising litters in human structures (Riley *et al.* 2010). However, as Bobcats adjust to human developed landscapes, indirect effects increase. Vehicle collisions can be a primary source of mortality in urban Bobcat populations (Riley *et al.* 2006) and in populations with a high proportion of transients (Blankenship *et al.* 2006). In addition, exposure to common rodenticides in urban landscapes can result in direct mortality (anticoagulant toxicosis) and increased susceptibility to severe notoedric mange resulting in the death of Bobcats (Riley 1999, Riley *et al.* 2003, Riley *et al.* 2006, Riley *et al.* 2007, Ruell *et al.* 2009, Serieys *et al.* 2013). Increases in urbanization and roads have also resulted in recent genetic isolation of Bobcats populations in several areas, indicating human developments are affecting historic dispersal patterns and gene flow, resulting in local and regional population structure (Riley *et al.* 2003, Croteau *et al.* 2012, Ruell *et al.* 2012, but see Millions and Swanson 2007).

There is concern in the northeastern US about interspecific competition with expanding coyote populations (Moruzzi *et al.* 2002, Litvaitis and Harrison 1989, Litvaitis *et al.* 2006). However, in Florida, where Coyotes have also increased, Thornton *et al.* (2004) found that Bobcats and Coyotes favoured different prey species, with coyotes taking larger ungulates and Bobcats rodents and smaller mammals, and Coyotes and Bobcats coexist throughout most of the western portions of their ranges, likely through niche shifts in diet and activity (Fedriani *et al.* 2000). Bobcats coexist with Ocelots in Texas (Horne *et al.* 2009) and Canada Lynx in zones of sympatry (Peers *et al.* 2013) through habitat partitioning. Aside from exploitative competition, there is evidence of interference competition through intraspecific killing by Mountain Lions (Haas 2009) and hybridization has been detected with few federally threatened Canada Lynx (*Lynx canadensis*) in Maine, Minnesota, and New Brunswick (Homyack *et al.* 2008). In addition, increased or novel sources of depredation in have been documented in several areas. Bobcat observations in southern Florida have decreased dramatically as invasive python densities have increased (Dorcas *et al.* 2012). In Ventura County, California, Coyotes were found to be the leading source of Bobcat kitten mortality (Moriarty 2007), although this increase in predation pressure is likely a result of reduced avoidance options in highly fragmented urban habitat (Riley *et al.* 2003). Interactions with domestic dogs may also present threats to the Bobcat population. Canine distemper and canine distemper-associated encephalitis has been documented in Bobcats in eastern Canada (Daoust *et al.* 2009) validating the proposed role of dogs as a pathogen-mediated apparent competitor with Bobcats (Vanek and Gompper 2009), and several studies demonstrate negative correlation between domestic dog activity and Bobcat activity (George and Crooks 2006, Reed and Merenlender 2011).

In localized areas Bobcats take domestic livestock and are persecuted as pests (Sunquist and Sunquist 2002). In addition, there have been recent concerns about the effects of harvest on local Bobcat populations in West Virginia (WV-DNR), and Michigan (Preuss and Gehring 2007) and poaching may result in higher harvest rates than anticipated in some areas (Millions and Swanson 2006), which can result in population declines as it has in New Hampshire (Litviatus *et al.* 2006). However, there is evidence from a survey of state game management agencies that Bobcat populations are stable or increasing, with densities greater than initially estimated, in all US states with the exception of Florida (Roberts and Crimmins 2010).

Conservation Actions **(see Appendix for additional information)**

Included on CITES Appendix II. The Mexican subspecies *Lynx rufus escuinapae* was listed on CITES Appendix I until 1992, when it was downlisted to Appendix II on the grounds that it is not a valid taxon (Govt of US 2007). Bobcats are legally harvested for the fur trade in 38 US states, and in seven Canadian

provinces. In Mexico, the Bobcat is legally hunted in small numbers as a trophy animal (Govt of US 2007). There appears to be little illegal international trade (Govt of US 2007), although within the US, Millions and Swanson (2006) used molecular forensics techniques to determine that skins reported as originating from an area with a higher bag limit were probably illegally taken from an area with a lower limit.

Bobcat status in the mid-western United States has improved since their extirpation in the early 1900s. In Iowa, Bobcats were downgraded to threatened in 2001 and are now harvested in many counties. In Illinois, Bobcats were removed from the states' list of threatened in 1999 and they are now found in nearly all counties. Indiana has sightings in much of the state and Bobcats were downgraded to special concern in 2005. In Ohio, the Bobcat is still classified as an endangered species and provided full protection.

Reintroduction of Bobcats to Cumberland Island, Georgia was highly successful (Diefebach *et al.* 2013) suggesting Bobcats can do well when protected. In addition, Kapfer and Potts (2012) found Bobcat harvest in Minnesota could be predicted by season length and suggest population densities can be manipulated by change in length of hunting season.

Credits

Assessor(s): Kelly, M., Morin, D. & Lopez-Gonzalez, C.A.

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Citation

Kelly, M., Morin, D. & Lopez-Gonzalez, C.A. 2016. *Lynx rufus. The IUCN Red List of Threatened Species 2016*: e.T12521A50655874. http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T12521A50655874.en

Disclaimer

External Resources

For Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.1. Forest - Boreal	-	Suitable	Yes
1. Forest -> 1.4. Forest - Temperate	-	Suitable	Yes
1. Forest -> 1.5. Forest - Subtropical/Tropical Dry	-	Suitable	Yes
3. Shrubland -> 3.4. Shrubland - Temperate	-	Suitable	Yes
3. Shrubland -> 3.5. Shrubland - Subtropical/Tropical Dry	-	Suitable	Yes
3. Shrubland -> 3.7. Shrubland - Subtropical/Tropical High Altitude	-	Suitable	Yes
4. Grassland -> 4.4. Grassland - Temperate	-	Suitable	Yes
4. Grassland -> 4.5. Grassland - Subtropical/Tropical Dry	-	Suitable	Yes
8. Desert -> 8.2. Desert - Temperate	-	Suitable	Yes
8. Desert -> 8.3. Desert - Cold	-	Suitable	Yes

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.2. Commercial & industrial areas	Ongoing	Minority (50%)	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.3. Agro-industry farming	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.3. Agro-industry grazing, ranching or farming	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
4. Transportation & service corridors -> 4.1. Roads & railroads	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		

http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T12521A50655874.en

5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.1. Intentional use (species is the target)	Ongoing	Minority (50%)	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.2. Unintentional effects (species is not the target)	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.3. Persecution/control	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.3. Logging & wood harvesting -> 5.3.5. Motivation Unknown/Unrecorded	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.1. Unspecified species	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Canis familiaris)	Ongoing	Minority (50%)	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.2. Species disturbance 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.2. Competition 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.8. Other		
8. Invasive and other problematic species, genes & diseases -> 8.5. Viral/prion-induced diseases -> 8.5.2. Named species	Ongoing	Minority (50%)	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.1. Species mortality		

Conservation Actions in Place

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions in Place
In-Place Land/Water Protection and Management
Occur in at least one PA: Yes
In-Place Species Management
Harvest management plan: Yes
In-Place Education
Included in international legislation: Yes
Subject to any international management/trade controls: Yes

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Actions Needed
2. Land/water management -> 2.1. Site/area management
3. Species management -> 3.1. Species management -> 3.1.1. Harvest management
3. Species management -> 3.1. Species management -> 3.1.2. Trade management

Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed
1. Research -> 1.1. Taxonomy
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.5. Threats
3. Monitoring -> 3.1. Population trends

Additional Data Fields

Distribution
Lower elevation limit (m): 0
Upper elevation limit (m): 3500
Population
Population severely fragmented: No

http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T12521A50655874.en

The IUCN Red List Partnership

The IUCN Red List of Threatened Species™ is produced and managed by the IUCN Global Species Programme, the IUCN Species Survival Commission (SSC) and The IUCN Red List Partnership.

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