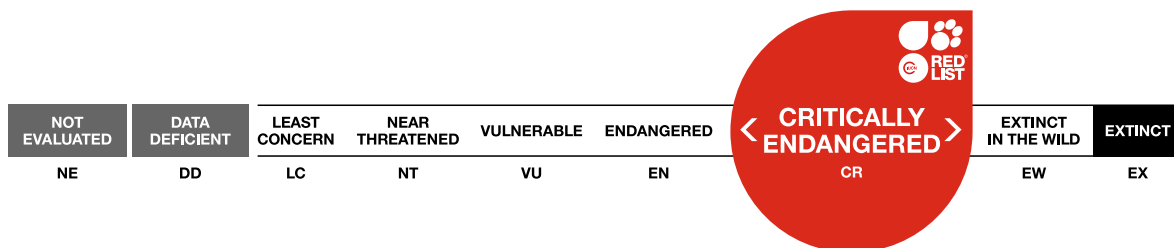


Rhinoceros sondaicus, Javan Rhinoceros

Assessment by: Ellis, S. & Talukdar, B.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Perissodactyla	Rhinocerotidae

Scientific Name: *Rhinoceros sondaicus* Desmarest, 1822

Infra-specific Taxa Assessed:

- *Rhinoceros sondaicus* ssp. *annamiticus*

Common Name(s):

- English: Javan Rhinoceros
- French: Rhinocéros de la Sonde
- Spanish; Castilian: Rinoceronte de Java

Taxonomic Notes:

There are three recognized subspecies: *Rhinoceros sondaicus sondaicus*, *Rhinoceros sondaicus annamiticus* (Extinct), and *Rhinoceros sondaicus inermis* (Extinct).

Assessment Information

Red List Category & Criteria: Critically Endangered D [ver 3.1](#)

Year Published: 2020

Date Assessed: May 28, 2019

Justification:

Based on camera trap data, an estimated 68 animals live in Ujung Kulon National Park on the western tip of Java, but only the 33% are inferred to be reproductive individuals. Therefore this species is listed as Critically Endangered under criterion D.

Previously Published Red List Assessments

2008 – Critically Endangered (CR)

<https://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T19495A8925965.en>

1996 – Critically Endangered (CR)

1994 – Endangered (E)

1990 – Endangered (E)

1988 – Endangered (E)

1986 – Endangered (E)

1965 – Unknown (N/A)

Geographic Range

Range Description:

The Javan Rhino formerly occurred from Bangladesh, Myanmar, Thailand, Lao PDR, Cambodia, Viet Nam, and probably southern China through peninsular Malaya to Sumatra and Java (Grubb 2005). The species' precise historical range is indeterminate, as early accounts failed to distinguish rhinos to specific level, due to partial sympatry with the other two Asian rhino species (*Rhinoceros sunicornis* and *Dicerorhinus sumatrensis*). Beginning in the middle of the nineteenth century, the species was extirpated from most of its historical range, and currently occurs only in one, small, isolated area. The last records of Javan Rhino vary, from 1920 in Myanmar, to 1932 in Malaysia, and 1959 on Sumatra (Indonesia) (Simon and Geroudet 1970).

The subspecies *Rhinoceros sondaicus inermis* formerly occurred in northeastern India, Bangladesh, and Myanmar, but is now extinct (Nowak 1999).

The subspecies *Rhinoceros sondaicus annamiticus* formerly occurred in Viet Nam, Lao PDR, Cambodia, and eastern Thailand. The last individual of this subspecies was poached in May 2010 in the Cat Loc part (Dong Nai province) of the Cat Tien National Park in Viet Nam (Brook *et al.* 2011).

The subspecies *Rhinoceros sondaicus sondaicus* formerly occurred from Thailand through Malaysia, to the islands of Java and Sumatra (Indonesia). The only remaining population occurs on the Ujung Kulon Peninsula (Hoogerwerf 1970), which forms the westernmost extremity of the island of Java. The Javan population of this subspecies has been restricted to this area since around the 1930s.

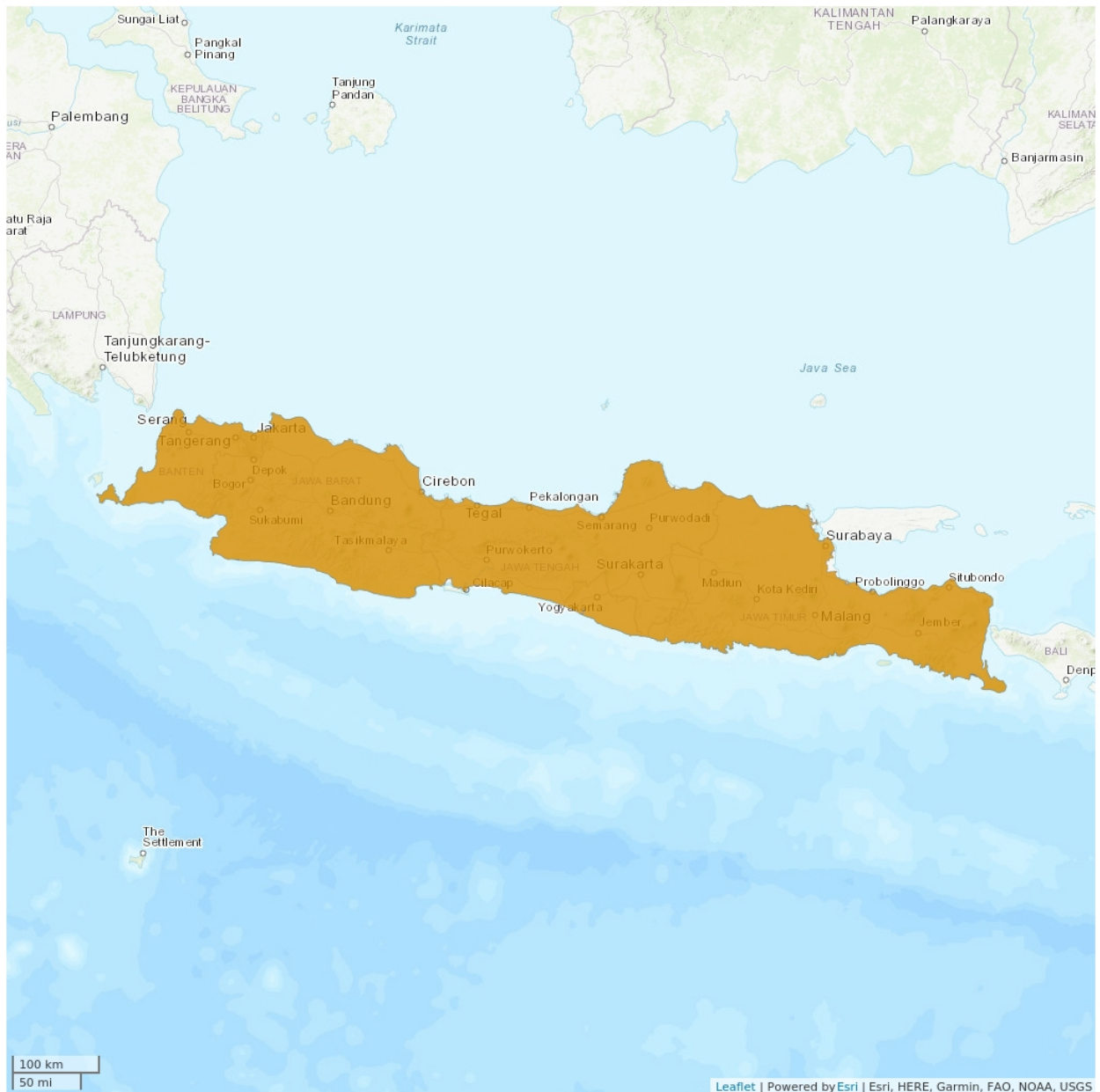
This is a lowland species that typically occurs up to 600 m (Sectionov and Waladi pers. comm.), but has been recorded above 1,000 m (Nowak 1999).

Country Occurrence:

Native, Extant (resident): Indonesia

Native, Extinct: Bangladesh; Cambodia; China; India; Lao People's Democratic Republic; Malaysia (Peninsular Malaysia); Myanmar; Thailand; Viet Nam

Distribution Map

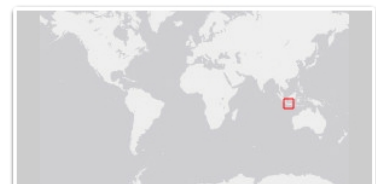
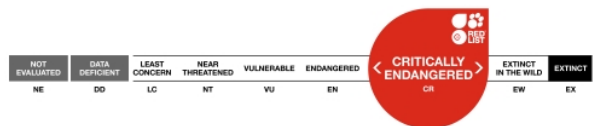


Legend

EXTANT (RESIDENT)

Compiled by:

IUCN (International Union for Conservation of Nature) 2020



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.



Population

Based on camera trap data, an estimated 68 animals (29 adult males, 24 adult females, and 15 juveniles), live in Ujung Kulon National Park on the western tip of Java (Ujung Kulon National Park 2018). It is not known how many of the adult animals are reproductive, but we infer that perhaps 33% of adults might breed. The addition of camera traps throughout the park has led to much more accurate population data. Camera trap data from studies conducted in 2013-2014, with coverage of the entire park, were verified by the IUCN/SSC Asian Rhino Specialist Group, showing that at that time, there were between 58-61 animals. The population has not grown significantly over the last two decades largely because of changes in the park's habitat caused by the Arenga palm (*Arenga obtusifolia*), possible food competition with the Javan Banteng (*Bos javanicus*), and human encroachment.

Three highly decomposed Javan Rhino carcasses with horns intact were discovered in 2010 (W. Ramono pers. comm.), and five animals with intact horns were found dead from 2010 to early 2019. The population in Cat Tien National Park in Viet Nam was declared extinct in 2010 (Brook *et al.* 2011).

There are no animals currently in captivity, and a total of only 22 individuals have ever been known to be held in captivity (Rookmaaker *et al.* 1998).

Current Population Trend: Stable

Habitat and Ecology (see Appendix for additional information)

The Javan Rhinoceros currently occurs in lowland tropical rainforest areas, especially in the vicinity of water (Schenkel and Schenkel 1969). The species formerly occurred in more open mixed forest and grassland and on high mountains. Because of its rarity, little is known about its preferred habitat, but it is not naturally restricted to dense tropical forest (Schenkel and Schenkel 1969); the habitat in which it currently exists may not be optimal.

Little is known about the species' biology. The home range size of females is probably no more than 500 ha, while males wonder over larger areas, with likely limited dispersal distance. The species is generally solitary, except for mating pairs and mothers with young (Nowak 1999). Its life history characteristics are not well known, with longevity estimated at about 30-40 years, gestation length of approximately 16 months (as with other rhino species), and age at sexual maturity estimated at 5-7 years for females and 10 years for males (Nowak 1999, International Rhino Foundation 2018).

Javan Rhino habitat preference is governed by a wide variety of biophysical site factors including sensitivity to human activity. While vegetation and elevation are clearly important determinants of rhino habitat, their influence is strongly modified by proximity to water, to mineral salt and especially to site conditions that favour the maintenance of long-term wallows (Ramono *et al.* 2009). In times of drought, water scarcity can become problematic as indicated in the history of Ujung Kulon National Park, and may severely restrict rhino movement.

Systems: Terrestrial

Use and Trade

Over-hunting for its horn and other medicinal products has driven this formerly widespread species to

the brink of extinction. There currently is no confirmation that Javan rhino horn is in trade. There has been no known poaching in Ujung Kulon National Park for the past 20 years; any rhino carcasses discovered have had intact horns. The last Javan Rhino was poached in Viet Nam in 2010 and found with its horn removed; we assume that Javan rhino horn has been in trade from Vietnam and for the Ujung Kulon population, poaching for horn is a looming threat requiring constant and enhanced protection of the population.

Threats (see Appendix for additional information)

The long-term cause of population decline is mainly attributable to the excessive demand for rhino horn and other products for Chinese and allied medicine systems (Foose and van Strien 1997). The remaining population occurs as a single population within one national park. The population size in Ujung Kulon National Park may be limited to the effective carrying capacity of the area (68 animals).

Available rhino habitat is limited by two major factors: (1) the threat of human encroachment and (2) the predominance of a palm species (*Arenga obtusifolia*), known locally as langkap, which is rampant in Ujung Kulon. *Arenga* dominates the forest canopy in many locations, and inhibits the growth of rhino food plants. *Arenga* palm is problematic for a number of reasons. Where *Arenga* palm dominates, little else grows. Currently, an estimated 60% (18,000 ha) of the peninsular section of the Park is covered with *Arenga* palm (B. Talukdar 2009 *in litt.*), precluding the growth of suitable rhino food. An *Arenga* palm removal/management effort was initiated in 2010 in the Gunung Honje portion of the park as part of the Javan Rhino Study and Conservation Area. As of December 2018, 150 ha of *Arenga* have been removed from the area.

Since 2014, there have been documented cases of fishermen using poison to fish in water bodies inside Ujung Kulon. The effect on the park's Javan rhinos is unknown, but this practice could have a serious effect if it goes unchecked.

Ujung Kulon National Park is home to up to 800 Javan banteng (*Bos javanicus*). Banteng are primarily grazers (but they browse when grass is in short supply) and their feeding ecology partially overlaps with Javan rhinos (also browsers). If banteng numbers are very large, as is the case in Ujung Kulon, there is a negative impact on availability of foraging plants for rhinos. It is believed that food competition with banteng may have contributed to the slow historical decrease in Javan rhino numbers.

Disease transmitted by local domestic cattle also is a potential threat (Khairani 2009).

Ujung Kulon and surrounding areas were decimated by the eruption of Krakatau in 1883, one of the most violent volcanic events in modern times. Following that eruption, lowland tropical forest habitats ultimately regenerated and were recolonized by Javan rhinos, among other species. However, should a similar large-scale eruption occur in the near future, Javan rhino populations would not be safe from the catastrophe and able to repopulate the region. Anak Krakatau (“son of Krakatau”) was still active through December 2018, when it collapsed underwater, causing a tsunami. Javan rhino populations were not affected.

Conservation Actions (see Appendix for additional information)

The Javan Rhino is legally protected in Indonesia and has been listed on CITES Appendix I since 1975.

Javan Rhinos have been protected and monitored by the Ujung Kulon National Park authority, the World Wildlife Fund - Indonesia (WWF - Indonesia) and/or Yayasan Badak Indonesia (YABI or the Rhino Foundation of Indonesia) over a period spanning three decades, using foot patrols and more recently, adding video camera trap monitoring. Over 3 decades, there have been no recorded rhino poaching events (the last rhino poaching incident was reported in the early 1970s). Five Rhino Protection Units (RPU), operated by Yayasan Badak Indonesia, currently protect the species in Ujung Kulon National Park, in addition to Park guards.

In 2007, the Government of Indonesia published the *Strategy and Action Plan for the Conservation of Rhinos in Indonesia* (Directorate General of Forest Protection and Nature Conservation 2007) which outlines a series of conservation actions for the species.

Following the preliminary implementation of the 2007 Strategy and Action Plan, in 2008 the IUCN/SSC Asian Rhino Specialist Group (AsRSG) convened a meeting to assess progress of the conservation strategy and to set immediate goals and actions. Whereas it was formerly believed that Ujung Kulon had the holding capacity for more than 100 Javan rhino, it was suggested that the park's carrying capacity had diminished to as low as 70 due to habitat changes and possible food competition with Javan banteng. The AsRSG and government representatives agreed that the habitat assessments for both Ujung Kulon National Park and possible second habitat relocation sites outside Ujung Kulon peninsula should be carried out by an independent agency to ensure critical information would be unbiased. Field surveys of the Ujung Kulon peninsula and proposed relocation sites on the island of Java in Gunung Honje, Gunung Halimun, Masigit Kareumbi and Leuweung Sancang were carried out (Ramono *et al.* 2009), with Gunung Honje emerging as the best Javan rhino habitat among these areas.

The Strategy and Action Plan for the Conservation of Rhinos in Indonesia, 2007-2017 recommended eradication trials of Arenga palm on a medium-sized scale to monitor rhino and banteng food plant development. In June 2010, the Government of Indonesia launched the Javan Rhino Conservation and Study Area, inside the Gunung Honje area of Ujung Kulon National Park, with the aim of intensifying active management, including creating new wallows, replanting natural forest vegetation with rhino food plants in some areas, carefully implementing controlled slash and burn patch management in designated and closed forest areas to promote regeneration of rhino food plants, and continuing and increasing anti-poaching protection, including establishing new patrol paths and additional guard posts, and constructing a fence to isolate the area in Gunung Honje so that the species' basic biology could be studied and individuals assessed for suitability for translocation (International Rhino Foundation 2018). One-hundred-fifty (150) ha had been cleared of Arenga palm as of the end of 2018 in the Javan Rhino Conservation and Study Area, which now is frequented by at least 10 rhinos.

In 2015, a Population and Habitat Viability Assessment was conducted (Haryono *et al.* 2016), which updates information and actions needed to conserve the species. The most important finding from the assessment was that the Ujung Kulon population absolutely cannot tolerate poaching.

For population monitoring, the Ujung Kulon National Park authority primarily relies on camera trap surveys at present. Faecal DNA analyses were started but have not been completed due to technical difficulties. Together, these techniques could combine to permit better understanding of population

genetics and spatial distribution on which future management decisions can be based.

Although the Ujung Kulon population is believed to be stable, the park may be close to carrying capacity and the population probably cannot grow significantly larger without additional intervention. The idea of establishing a second population has been under discussion for almost a decade by the IUCN/SSC Asian Rhino Specialist Group, various NGOs, and the Government of Indonesia. No significant progress in developing a second population has been made to-date. There is an urgent need to review the feasibility of a range expansion program, since the only known viable population occurs in a geographically restricted area of Java.

Credits

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Authority/Authorities: IUCN SSC Asian Rhino Specialist Group

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External Resources

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Appendix

Habitats

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

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.6. Forest - Subtropical/Tropical Moist Lowland	Resident	Suitable	Yes
1. Forest -> 1.9. Forest - Subtropical/Tropical Moist Montane	Resident	Marginal	-

Use and Trade

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

End Use	Local	National	International
Medicine - human & veterinary	Yes	Yes	No

Threats

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

Threat	Timing	Scope	Severity	Impact Score
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.2. Small-holder farming	Past, unlikely to return	-	Unknown	Past impact
	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	Past, unlikely to return	-	Causing/could cause fluctuations	Past impact
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.1. Intentional use (species is the target)	Ongoing	-	-	Low impact: 3
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.3. Logging & wood harvesting -> 5.3.5. Motivation Unknown/Unrecorded	Past, unlikely to return	-	-	Past impact
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		

Conservation Actions in Place

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

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: Yes
Systematic monitoring scheme: Yes
In-place land/water protection
Conservation sites identified: Yes, over entire range
Percentage of population protected by PAs: 91-100
Area based regional management plan: Yes
Occurs in at least one protected area: Yes
Invasive species control or prevention: Yes
In-place species management
Harvest management plan: No
Successfully reintroduced or introduced benignly: No
Subject to ex-situ conservation: No
In-place education
Subject to recent education and awareness programmes: Yes
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 Action Needed
1. Land/water protection -> 1.1. Site/area protection
1. Land/water protection -> 1.2. Resource & habitat protection
2. Land/water management -> 2.1. Site/area management
2. Land/water management -> 2.2. Invasive/problematic species control
2. Land/water management -> 2.3. Habitat & natural process restoration
3. Species management -> 3.1. Species management -> 3.1.2. Trade management
3. Species management -> 3.2. Species recovery
3. Species management -> 3.3. Species re-introduction -> 3.3.1. Reintroduction
3. Species management -> 3.4. Ex-situ conservation -> 3.4.1. Captive breeding/artificial propagation
3. Species management -> 3.4. Ex-situ conservation -> 3.4.2. Genome resource bank

Conservation Action Needed
4. Education & awareness -> 4.1. Formal education
4. Education & awareness -> 4.2. Training
4. Education & awareness -> 4.3. Awareness & communications
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.1. International level
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.2. National level
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.3. Sub-national level
6. Livelihood, economic & other incentives -> 6.1. Linked enterprises & livelihood alternatives

Research Needed

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

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.4. Harvest, use & livelihoods
1. Research -> 1.5. Threats
1. Research -> 1.6. Actions
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km ²): 450
Continuing decline in area of occupancy (AOO): Unknown
Extreme fluctuations in area of occupancy (AOO): No
Estimated extent of occurrence (EOO) (km ²): 673
Continuing decline in extent of occurrence (EOO): No
Extreme fluctuations in extent of occurrence (EOO): No
Number of Locations: 1
Continuing decline in number of locations: No
Extreme fluctuations in the number of locations: No

Distribution
Lower elevation limit (m): 0
Upper elevation limit (m): 600
Population
Number of mature individuals: 18
Continuing decline of mature individuals: Unknown
Extreme fluctuations: Unknown
Population severely fragmented: No
No. of subpopulations: 1
Continuing decline in subpopulations: No
Extreme fluctuations in subpopulations: No
All individuals in one subpopulation: Yes
No. of individuals in largest subpopulation: 50
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: No
Generation Length (years): 12
Movement patterns: Not a Migrant
Congregatory: Congregatory (and dispersive)

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