

Punjab ENVIS Newsletter

Vol 14, No. 3 (2016-17)

ISSN No. 2347-2960



# THE State Bird of Punjab

**NORTHERN GOSHAWK**



*Status of Environment & Related Issues*

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## EDITORIAL

*Globally, it is an emerging recognition that biological and cultural diversity are vital building blocks for sustainable development. Going back to historic time period, care and respect for faunal species is quite evident in every continent and has been influenced by the cultural associations and religious beliefs. One of the prominent live examples reported by anthropologists and ornithologists is of hawks, the spectacular birds of prey which were revered in many ancient cultures. "Hawks" were considered as Apollo's messengers for the Greeks, sun symbols for the ancient Egyptians and in the case of the Lakota Sioux (tribes of North America), embodiments of clear vision, speed and single-minded dedication.*

*Goshawks were the "most-prized hawks" in India, since Mughal period due to their royal associations with the culture. The female was called the 'baaz' while the male was called 'jurra'. The father of Indian ornithology, TC Jerdon, wrote in 1862 that the female goshawk (which is larger than the male) would sell for a princely sum at that time. India's specialist on birds of prey, Rishad Naoroji has all praises for its hunting skills.*

*Northern goshawk (Accipiter gentilis), the State Bird of Punjab has cultural association and significance in sikh religion. It is locally known as "Baaj" and has been traditionally revered as a symbol of strength. The tenth master, Guru Gobind Singh Ji, had many titles bestowed upon him, one of the well-known is 'Chitae bajah wala', the keeper of the white hawk. It also plays an important role in the forest food web as voracious predator to maintain the balance in forest ecosystem.*

*This bird species suffered a significant historical decline due to persecution and deforestation claiming its habitat. Despite changing attitudes towards birds of prey, persecution still continues in some areas, as well as nest-robbing for falconry. Further, the pollution by pesticides and heavy metals has also contributed to its declining numbers over the years in its geographical range.*

*Though it has been declared the state bird of Punjab, the goshawk is not known to migrate to Punjab from the higher Himalayas. The publication of this issue of Newsletter is an effort to give deserved importance to the State bird which represents the cultural heritage & treasure of Punjab and instil a sense of pride and honour in the citizens of Punjab State. It is hoped that the concerned departments and organisations would commence initiatives / actions for habitat development to maintain the reasonable population of the bird in the region.*

ENVIS Centre, PSCST is a partner in Regional Centre of Expertise (RCE) Chandigarh on Education for Sustainable Development (ESD) of United Nations University - Institute of Advanced Studies, Japan This article on the State Bird 'Northern Goshawk' is to promote the awareness and the need to conserve the important Birds of prey which are the vital indicators of ecosystem for sustainable living.

## Introduction

India, one of the seventeen mega biodiversity countries in the world, occupies about 2.4% of the global land area but harbour more than 7-8% known global biodiversity ([www.moef.nic.in](http://www.moef.nic.in)). Large varieties of ecosystems present in the ten bio geographic zones of India have provided appropriate environments to its diverse fauna to survive and propagate.

Since times, conserving biodiversity has been a part of India's culture with active participation of communities. Honouring and symbolizing different animals and birds at the national and at the state level creates awareness about the faunal wealth of the country and responsibilities towards it.

Globally, the issue of instituting animal and bird symbols was conceptualized in the year 1960, in the International Council for Bird Preservation that met in Tokyo to encourage governments around the world to designate a national bird to encourage protection. The Government of India, Department of Environment, Wild Life Section vide letter No. 1-2/83-FRY (WL), dated 17.03.1983 suggested that each State should have its own State Animal / Bird / Tree with adequate justifications. The National Board for Wildlife (NBWL) became the recommending authority to the Government of India for declaring national bird, tree and animal. It got reflected in the declaration of different animals, birds and trees as national and state symbols in India. At the national level four animals have been symbolized as National Animal (Tiger), National Aquatic Animal (Dolphin), National Heritage Animal (Elephant) and National bird (Peacock). The national and state birds of India are shown in Map 1.

## State Bird of Punjab

"Northern Goshawk" is the state bird of Punjab. The Government of Punjab, announced the "Northern Goshawk" as the state bird vide notification No. 34/11/2015-Ft-5/592880/1 dated 18.09.2015 by correcting the anomaly in the earlier notification (No. 34(13)Ft-IV-83/6048 dated

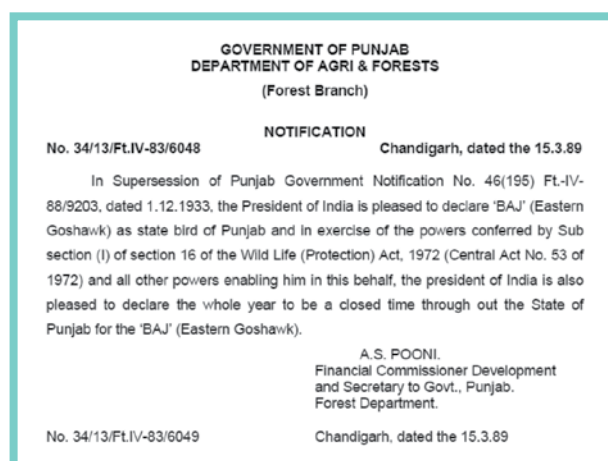
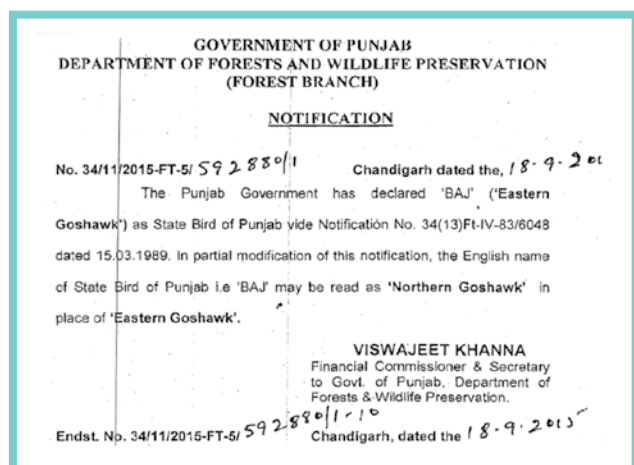


Northern goshawk

15.03.1989) which had declared the 'Eastern Goshawk' as the official bird in place of its predecessor the "Hoopoe" (Box 1) as the state bird of Punjab (declared vide No. 46(195) Ft-IV-88/9203, dated 1.12.1933).

Since the time of official declaration of 'Eastern Goshawk' as state bird, debates had been going on this name because as per ornithologists, there is no such bird as the Eastern Goshawk. However, there is an "Eastern Chanting Goshawk" which is a bird of prey endemic to Africa. But this has no connection to Punjab. On the other hand, the Northern Goshawk, has cultural association and significance in sikh religion (Box 2) and thus the Northern goshawk (*Accipiter gentilis*) locally known as "BaaJ" was recognized as the State bird of Punjab, India.

## Declaration of State Bird Notifications





**Map 1: State Birds in India**



National bird, Peacock is native to the sub-continent and is an integral part of India's culture, history and tradition. It also has religious association with all of the major religions of India i.e. Hinduism, Islam and Christian, etc. The Peacock was officially announced as the National Bird in 1963 by the Government of India.

The Peacock (*Pavo cristatus*) is an epitome of grace, a symbol of beauty, a representation of joy, love and invokes a sense of pride and mysticism. It is a living rainbow showing the richness of colours and is a born dancer. The trail of peacock changes colour with a change in the angle of light. The Peacock hunting is prohibited in India and it is protected under Schedule I of the wildlife protection Act, 1972.

### BOX 1: Hoopoe: Previous State Bird of Punjab



Hoopoe (*Upupa epops*) locally known as Chakki Harhaa (ਚੱਕੀਹਾਹਾ, ਝੋਝੇਦੁੱਖ) was the State Bird of undivided Punjab. Since times, this highly distinctive bird has cultural associations. It was seen as a 'friend of the farmer' because its diet consists of insects which farmers consider as pests (grubs, insect larvae and worms), thus benefiting agriculture. The Hoopoe has also been described as the 'poor man's peacock' due to its erectile crest. **Hoopoe is in the same clad as kingfishers, rollers and bee-eaters but they're genetically lonely, being the last existing bird in the family Upupidae.**

#### Major Characteristics

- Medium-sized birds with long, broad, rounded wings, slightly de-curved bills & unique fan-like crests that open over the top of the head with beak as its most important tool.
- Its call is soft, quick, poo-poo-poo notes, which give them their common name "Hoopoe".
- Hoopoes are widespread in India, and have been recorded on Mt Everest at 26,000ft.
- They nest in cavities in rocks/ trees/buildings & feed on the ground, searching for insects, worms, small reptiles, etc.
- The male & female (slightly duller) have almost identical plumage
- Their flight resembles that of a butterfly.
- They are often seen bathing in the sun and sand
- Hoopoes like warm temperatures & thrive best in areas of low-intensity farming with minimum use of pesticides.
- They own a gland which releases a foul-smelling secretion akin to rotten flesh which may discourage predators.
- They have a peculiar courtship ritual that revolves around food. The male presents insects to the female for her to eat — a type of so-called "nuptial gift."
- Presently, Hoopoe is the national bird of Israel.



Indian Grey Hornbill (*Ocyrceros birostris*) or common hornbill (ਧਾਨ ਚਿੜਾ) was declared State bird of Chandigarh (UT) and Capital of Punjab in 2009. It is mostly arboreal and is commonly sighted in pairs. It has grey feathers all over the body with a light grey or dull white belly. The horn is black or dark grey with a casque extending up to the point of curvature in the horn.

Source : [www.rspb.org.uk](http://www.rspb.org.uk) & [www.creaturefacts.wordpress.com](http://www.creaturefacts.wordpress.com)

### Northern goshawk : Cultural Association in Punjab

As per anthropologists and ornithologists the Northern Goshawk has been reported to be an amazing bird of prey with its long association in different cultures. The bird has princely associations with the Indian culture. It has cultural association in Punjab and significance in Sikh history due to the beliefs for its association with Sikh Gurus. Falconry or hawking was relished by four Sikh gurus: Guru Hargobind, Guru Har Rai, Guru Tegh Bahadur and most intensely by Guru Gobind Singh Ji. The possession of Goshawk was a multi-faceted symbol of over-arching military powers of the Gurus. Not only was it an essential part of chivalry, the Gurus also wanted to inspire the minds of their disciples with the grandeur and glory of the new religion. In a Pahari miniature of the Guler school (c.1800)

preserved in the Lahore Museum, Guru Tegh Bahadur, known for his achievements in swordsmanship, is shown with a (Northern) goshawk on his gauntlet.

Guru Gobind Singh Ji possessing the fearless spirit of his warrior grandfather (Guru Hargobind), and father (Guru Tegh Bahadur), the Guru himself retained the bird gifted to him by Ratan Rai of Bengal. Recognising the fighting prowess of his hawk, the Guru Ji permanently retained it on his character earning him the name, '*chitae bajah wala*' (ਚਿੱਟੇ ਬਾਜਾਂ ਵਾਲਾ). Guru Gobind Singh Ji associated and promoted the characteristics possessed by the bird in his disciples (Singhs). Guru Gobind Singh Ji was instrumental in giving a section of the Sikhs—the Khalsas—a distinctive identity, not just physically but in terms of Spirit. He wanted them to be fearless and be able to defend themselves. The similar traits between Guru Gobind Singh Ji's Baaz and Singh's are enumerated in Box 2.

## Box 2: Significance of Baaz in Sikhism.

The similar traits between Baaz and Singh are as under :

1. **One cannot keep Baaz in a Cage; either Baaz will break it or Die.**

Similarly, Singh cannot accept Slavery and repression. He shall always struggle for his freedom and honor.

2. **Baazs are courageous, strong and extremely agile birds provided with dreadful weapons.**

Similarly, Singhs are respectful, courageous, hardworking, and enterprising. Weapons, especially the sword has a deep spiritual meaning within Sikhism. The Kirpan is one of the articles of faith that every baptized Sikh Khalsa is required to carry at all times. It shows the force of Good that shall ever strive to protect truth and weak and the destroyer of evil and tyrant.

3. **Baaz has very good eye sight they can spot a meal up to a mile away. They always fly high and keep a close eye on their meal in the bottom.**

Similarly, in daily Ardaas, Singh seeks "Man neeva Mat uchi" which means Singh must discard his or her ego, arrogance and haughtiness and always keep high moral values and high spiritual principles.

4. **Baaz is the swiftest birds of prey and is very muscular. They catch their prey in mid-air. It has been observed that if their meal falls to the ground, they won't go to get it. In fact, they don't usually fly lower than the level of their nest. And also it is believed that Baaz catch prey on their own; and never eats other's food.**

Similarly, Singh always take stand on their rights, belief and truth and never indulge in taking other person's rights.

Even today, it is believed that many true devotees, do have a 'darshan' of the Guru's hawk at Hazur Sahib, Nanded. The Sikh religious book Shri Guru Granth Sahib has mention of the Bird in following verses:

*Vaar Malaar ki Mehla 1, Sloak Mehla 1, preceding pauri 22, page 1288*

ਮ: ੧ ॥ ਹਰਣਾਂ ਬਾਜਾਂ ਤੈ ਸਿਕਦਾਰਾਂ ਏਨ੍ਹਾ ਪੜਿਆ ਨਾਉ॥  
ਫਾਂਧੀ ਲਗੀ ਜਾਤਿ ਫਰਾਇਨਿ ਅਗੈ ਨਾਹੀ ਥਾਉ॥  
ਸੋ ਪੜਿਆ ਸੋ ਪੰਡਿਤੁ ਬੀਨਾ ਜਿਨ੍ਹੀ ਕਮਾਣਾ ਨਾਉ॥

*Deer, hawk/falcons and government officials are known to be trained and clever. When the trap is set, they trap their own kind; hereafter they find no place of rest. He alone is learned and wise, and he alone is a scholar, who practices the Name. Hurting others takes one away from God.*

*Sloak Mehla 1, preceding pauri 14, page 144*

ਸਲੋਕ ਮ: ੧ ॥ ਸੀਹਾ ਬਾਜਾ ਚਰਗਾ ਕੁਹੀਆ ਏਨਾ ਖਵਾਲੇ ਘਾਹ॥  
ਘਾਹੁ ਖਾਨਿ ਤਿਨਾ ਮਾਸੁ ਖਵਾਲੇ ਏਹਿ ਚਲਾਏ ਰਾਹ॥  
ਨਦੀਆ ਵਿਚਿ ਟਿਬੇ ਦੇਖਾਲੇ ਬਲੀ ਕਰੇ ਅਸਗਾਹ॥  
ਕੀੜਾ ਥਾਪਿ ਦੇਇ ਪਾਤਿਸਾਹੀ ਲਸਕਰ ਕਰੇ ਸੁਆਹ॥  
ਜੇਤੇ ਜੀਅ ਜੀਵਹਿ ਲੈ ਸਾਹਾ ਜੀਵਾਲੇ ਤਾ ਕਿ ਅਸਾਹ॥  
ਨਾਨਕ ਜਿਉ ਜਿਉ ਸਚੇ ਭਾਵੈ ਤਿਉ ਤਿਉ ਦੇਇ ਗਿਰਾਹ॥੧॥

*Sloak Mehla 1: Tigers, hawks, falcons and eagles-the Master could make them eat grass. And those animals which eat grass - He could make them eat meat. He could make them follow His way of life. He could raise dry land from the rivers, and turn the deserts into bottomless oceans. He could appoint a worm as king, and reduce an army to ashes. All beings and creatures live by breathing, but He could keep us alive, even without the breath. As it pleases the Master, He gives us sustenance.*

*Source: Kapoor et al, 2006*

## Northern Goshawk Facts

### Name & Classification

The Northern goshawk is an English name that derives from an Anglo-Saxon word "goose-hawk". The scientific name, *Accipiter gentilis* means "Nobleman's Hawk" which was given during the Middle Ages because at that time only the nobility were permitted to fly goshawks for falconry ([www.globalraptors.org](http://www.globalraptors.org) & [www.dictionary.com](http://www.dictionary.com)).

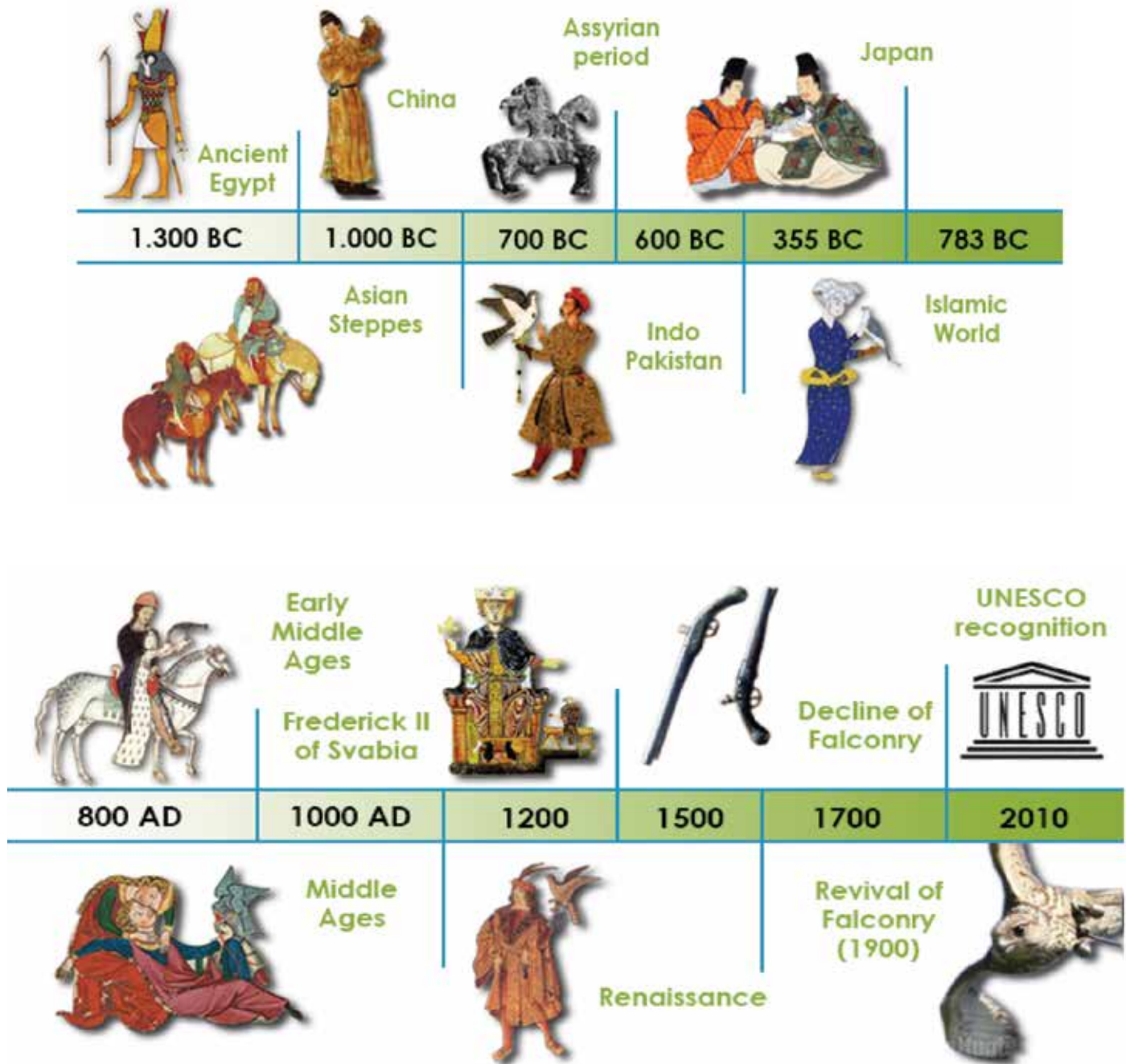
Northern goshawk is a raptor that belongs to the family Accipitridae which includes diurnal raptors, such as hawks, kites, eagles, buzzards and harriers. As a species in the *Accipiter*

genus, the goshawk is often considered a true "hawk". The large genus *Accipiter* contains 51 species ranging from the small African Little Sparrow hawk (*Accipiter minullus* ; weighs about 75-85 grams) to the female Northern Goshawk (*Accipiter gentilis*; weighs 1400 grams)( [www.wildearthguardians.org](http://www.wildearthguardians.org)).

The first formal description of the northern goshawk was given by Swedish naturalist Carl Linnaeus in 1758 in the tenth edition of his book "*Systema Naturae*" under the name *Falco gentilis*. Thus, *Accipiter gentilis* was earlier included in the genus *Falco*. It is closely related to *A. henstii* and *A. melanoleucus*. The current genus *Accipiter* was introduced by the French zoologist Mathurin Jacques Brisson in 1760.



## Falconry in different cultures



*Ever since medieval times Northern goshawk has been regarded as fearsome and admirable hunter by the falconers.*

### World Falconry Day

November 16<sup>th</sup> is celebrated as World Falconry Day as a recognition of Falconry by United Nations Educational Scientific and Cultural Organisation (UNESCO) as intangible cultural heritage. It is organized by International Association for Falconry and Conservation of Birds of Prey, Brussels, Belgium.

Source: [www.iaf.org](http://www.iaf.org)

## Physical Characteristics of Northern goshawk

*Accipiter gentilis* is large hawk and revered as a symbol of strength. It is the largest raptor and bulkiest of all the Accipiters. It has strong legs, sharp & curved talons, sharp/ powerful & curved beak, powerful wings, keen eyesight and is a swift flier that can soar for long periods. It possesses broad & rounded wings that enable rapid acceleration. Its long wedge-shaped tail acts as a rudder which provides it superb aerial agility and exceptional manoeuvrability while flying between trees. The relatively long secondary flight feathers give the trailing edge of the wing a curved or bulging look. Its wingtips look pointed in flight.

Adult goshawks are about the size of Common Raven i.e. about 2 feet (.61m) in size from head to tail. Male and female goshawk shows reverse sexual dimorphism i.e. females are larger in size than males. The male generally weighs between 630gm and 1100gm, average 55cm in length and have a wingspan ranging from 98cm to 104cm. Females are slightly larger, weighing on an average between 860gm and 1360 gm and having wingspan of 105cm – 115cm & an average length of 61cm ([www.animaldiversity.org](http://www.animaldiversity.org)).

An adult/mature Northern goshawk is dark slate grey to brown grey colour on the above side (including head, nape, back, wings & tail) with pale/light grey barred under parts i.e. chest and belly (including under wings). The head has a cap which appears to be black.

### Raptor Features



Huge eyes



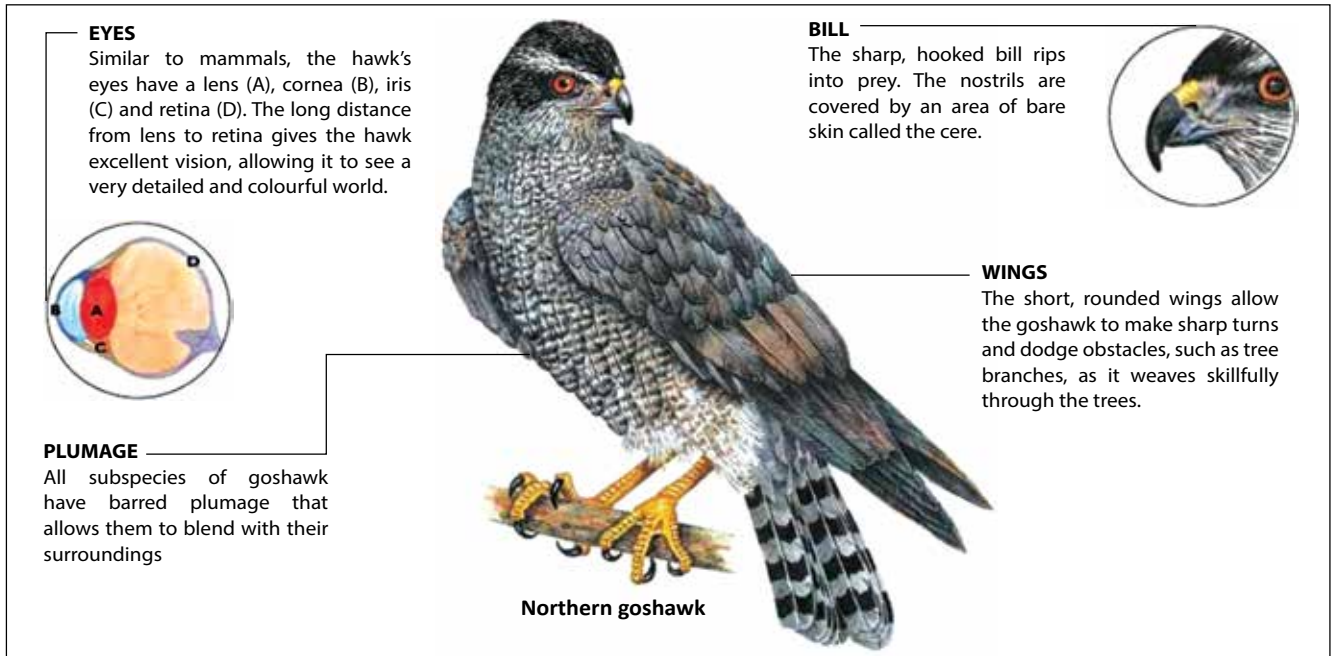
Curved beak



Sharp talons







**Male Northern goshawk**



**Female Northern goshawk**

### Interesting Facts about Goshawks

- Goshawk have ecological importance in forest ecosystems being a top predator in food web and an ecological engineer.
- The oldest Goshawk on record from a European ringing study was 18yrs 9months old.
- In ancient times they were also called "cook's hawk" for their success at snaring meat for the pot.
- Like all accipiters, Northern Goshawks display "reversed sexual size dimorphism"
- Siberian goshawks are nearly white.
- Goshawk pairs build and maintain up to eight alternate nests within their nesting area. They may use the same nest year after year, or may switch to a new nest after a brood fails.
- Pairs may add fresh conifer needles to the nest during breeding as aromatic chemicals (terpenes) in the needles may act as a natural insecticide and fungicide.
- The Northern Goshawk is well known for its fierce defense of its nest.
- Northern goshawks are the fastest of all the raptors over a short distance. During hunting, their average chase time is less than 8 seconds.
- In the breeding season, female goshawks will attract males in the area by performing a unique "undulating flight display" and calling, or alternatively by perching in the nesting area and calling gull-like calls.
- Northern goshawks can be very persistent in going after their prey.
- Northern Goshawks have been prized for many centuries as falconry birds, mainly for their fast flying skills and fearless hunting. In 1930s, Amritsar and Masulipattam, Madras were the known markets for hawks & falcons.
- The northern goshawk appears on the flag of the Azores (Portugal). The goshawk features in the crest of the Drummond Clan (Scotland)
- Attila the Hun (ruler of the Hunnic Empire) wore an image of a Northern Goshawk on his helmet.

Source: [www.bbc.co.uk](http://www.bbc.co.uk), [www.raptorshelter.org](http://www.raptorshelter.org) & [www.pauldfrost.co.uk](http://www.pauldfrost.co.uk)

They have a prominent white stripe over the eye known as supercillum (a stripe which runs from the base of the bird's beak above its eye, finishing somewhere towards the rear of the bird's head and is thought to protect its eyes when it dives into thick bush to hunt prey). The eyes of the bird are orange to red.

The long tail has horizontal dark barring and a white terminal band. There are minor variations among the goshawk subspecies in eye colour and level of grey or white colouration of breast & belly. The mature females are browner in colour and are coarsely barred with large, white and fluffy under tail coverts. Their feet, cere (a fleshy portion around the nostrils), legs are yellow (with black talons).

The juveniles or immature goshawks are brown and streaky, with narrow dark bands in the tail. Female juveniles are also larger than males. On the head, the supercillum is less conspicuous, mostly pale buff and shorter than in adults. They have an indistinct pale eyebrow stripe and yellow eyes. The immature has yellow iris until its 4<sup>th</sup> year. The tail is long with irregular dark bands and light barring above and below each band. However, the feet, cere and legs are yellow with black talons like adults ([www.indianbirds.thedynamicnature.com](http://www.indianbirds.thedynamicnature.com), [www.allaboutbirds.org](http://www.allaboutbirds.org), [www.wildearthguardians.org](http://www.wildearthguardians.org) & Rashid, 2016). The species similar to Northern goshawk are described in **Box 3**.

### **Box 3. Northern goshawk and similar bird species**

Northern goshawk, Cooper's hawk, Red-shouldered Hawk and Sharp-shinned Hawk are short-winged, long tailed, forest-dwelling raptors, with barring on their tails & wings. All have a characteristic flight "flap flap, glide" but it is sometimes seen soaring in migration. The bird is also sometimes confused with gyrfalcon, especially when they pursuit in high speeds with their wingtips drawn backward in a falcon like profile.

	Northern goshawk	Cooper's Hawk	Sharp-shinned Hawk	Red-shouldered Hawk	Gyrfalcon
<b>Habitat</b>	Wild forests and tend to occur in large tracts.	Wooded habitats from deep forests to leafy subdivisions and specially in backyards	Found in deep forests	Deciduous woodlands, often near rivers & swamps.	Arctic tundra usually in open fields, coastlines, dunes, prairie & shrub steppe.
<b>Size</b>	Largest & bulkiest about size of Common Raven	Medium sized like American crow; more heavy-bodied and muscular	Very small & delicate hawk size like blue or Steller's Jay	Medium-sized	Largest Falcon in the world
<b>Shape &amp; Colour</b>	Dark slate grey /frosty grey above with pale grey barring on under-parts  Dark head with a wide white stripe over the red eye; bold white eyebrow	Blue-grey above with reddish barring on under-parts & thick dark bands on the tail  Head larger with dark grey cap & more rectangular than Sharp-shinned  Neck more clearly defined  Thicker yellow legs, and proportionately larger feet	Slaty blue-grey above, with narrow, horizontal red-orange bars on the breast; small rounded head; long tail	Stocky, compact Buteo  Reddish-orange barring on breast  Bold black and white markings on wings and tail  Long yellow legs	Though the bird has classic image of regal white bird with black spotting, however, the birds occur in shades of white, gray, and dark brown
<b>Juvenile</b>	Belly has heavily marked under-parts  Tail has a thin white band & uneven barring	Belly is lightly barred  Tail has distinctive terminal band with even barring  Wings are narrower and less pointed than Northern goshawk	Coarse vertical streaks on white under parts  Tail has dark bands  Wings are narrower & less pointed than Northern goshawk	Shows a belly band and heavily marked on the upper chest & under parts	Heavily streaked; flight feathers are lighter in contrast with the rest of the wing.

Source: [www.allaboutbirds.org](http://www.allaboutbirds.org), [www.birdzilla.com](http://www.birdzilla.com), [www.hawkmountain.org](http://www.hawkmountain.org) & Rashid, 2016

Species similar to Northern goshawk



Coopers Hawk



Sharp Shinned Hawk



Red Shouldered Hawk



Gyr Falcon



## Habitat

Goshawks are birds of wild forests and tend to occur in large tracts. The Northern goshawk occurs in both coniferous and deciduous forests i.e. from lowlands into mountainous, subalpine areas. In particular it prefers woodland edges that border open areas, and occasionally found in town parks. It prefers old-growth forests with large trees, downed logs and an open understory. Northern Goshawks in their range, nest in mature and old-growth forests with more than intermediate canopy i.e. about 60% closed canopy and tiny openings just below especially for hunting purpose. It usually lives in areas where human existence is very low. In India the northern goshawk species inhabit mature, deciduous and coniferous forests, preferring areas near clearings and the forest edge ([www.indianbirds.thedynamicnature.com](http://www.indianbirds.thedynamicnature.com) & [www.animaldiversity.org](http://www.animaldiversity.org)).



Northern goshawk in Nest

It has been reported that during winter, the species inhabit a fragmented landscape of forests, wetlands and agricultural lands and the non-forested habitats when large patches

of forest are not available. Squirrel and Reynolds 1997 has reported the goshawk nesting area of approximately thirty acres (12.49 ha) and may include upto eight different nests (Rashid, 2016). Some Ornithologists have described that the Northern goshawk prefers three areas, the nest area, post-fledging area and foraging area (Rashid, 2016 & Reynolds et.al., 1992).

Usually they build nest against the tree trunk. The nest is built with twigs and is lined with leafy twigs. Northern Goshawks usually choose the largest trees in a stand for nest sites, placing the nest next to the trunk on a large horizontal branch or in a primary or secondary crotch. Finished nests measure 3–4 feet long, 1.6–2.2 feet wide, and nearly 2 feet high. The interior cup of the nest is about 9 inches in diameter and 3 inches deep. The nests are usually high up & under good cover of a canopy of leaves, giving protection from predators & weather ([www.allaboutbirds.org](http://www.allaboutbirds.org), [www.indiamapped.com](http://www.indiamapped.com), [www.wildearthguardians.org](http://www.wildearthguardians.org) & Rashid, 2016).



Nest of Northern goshawk

## Behaviour & Habits

Northern goshawks hunt in forest, along riparian corridors, and in more open habitats where their broad, powerful wings can quickly generate speed to ambush prey. N. goshawk is opportunistic predator whose diets vary considerably depending upon prey availability. A robust prey population is important for the species. Snags, coarse woody debris and diverse ecosystems are known to support an abundance of prey species.

N. goshawks feed on many medium-sized birds or animals. It eats a wide range of prey than any other accipiter, including birds, mammals and reptiles as well as insects and occasionally carrion. The most important prey species are rodents and birds, especially the grouse, pigeons doves and passerines (mostly starlings & crows). However, grouse is their favourite food and water fowl in fall & winter feed (Rashid, 2016). Usually, the prey is often smaller than the hunting hawk but these birds rarely kill much larger animals. Tree and ground squirrels, snowshoe hares, jackrabbits, and cottontails are the main mammal prey. Northern goshawks have also been documented hunting owls, kestrels and honey buzzards, among other raptor species. It has been observed that individual birds may show a preference for one type of prey.

## Habitats of Northern goshawk



Source: [www.bbc.co.uk](http://www.bbc.co.uk)



**Northern goshawk with prey**

Prey is taken out of the air, on the ground or even out of the trees ([www.pauldfrost.co.uk](http://www.pauldfrost.co.uk) & [www.allaboutbirds.com](http://www.allaboutbirds.com)).

When breeding, goshawks cache food in order to maintain a ready supply for their young, especially when the nestlings are small and require frequent, small feedings. Cached prey items usually are placed on a branch near the trunk or are wedged between branches.

The cyclic nature of the prey species affects goshawk movements and they migrate (in years) when populations of these prey species crash. Avian prey is plucked prior to being eaten, and goshawks typically have a traditional plucking post within their territory. The piles of feathers on the forest floor indicate a low “plucking perch” near a goshawk nest.

Goshawks are silent predators that watch for prey on high perches and then attack with quick and agile flight through dense trees or cluttered understory. It usually hunts from a well-concealed perch, remaining briefly at one spot before making a short flight to another; although it may also make survey flights along forest edges and over clearings. Once prey is spotted, the northern goshawk directly attack a flying bird by fast coursing, high soaring flight, or glide and chase. They are capable of incredible bursts of speed (high speed flight over 500 metres) when chasing prey. The short wings & manoeuvrable tail enable the bird to rapidly turn & brake, in pursuit of its prey. Despite this excellent manoeuvrability, goshawks frequently injure themselves while chasing their

prey. They are totally focused on their prey & collide with obstructions in their way. However, it has been observed that it seldom results in death. Upon catching its prey, the goshawk usually returns to a favourite perch, kills the prey with the strong talons and plucks the prey before eating it. Quite often, the entrails will also be removed first ([www.audubon.org](http://www.audubon.org), [www.hawkmountain.org](http://www.hawkmountain.org), [www.beautyofbirds.com](http://www.beautyofbirds.com) & [www.peregrinefund.org](http://www.peregrinefund.org)).



**Northern goshawk plucking prey**

The northern goshawk is not a social species. Its breeding season is from early April to early June. Goshawks are highly territorial. Usually the nests of the breeding pairs’ are around 1km apart. They are believed to mate for life ([www.bbc.co.uk](http://www.bbc.co.uk))

Goshawks are usually silent except when they are courting but it performs spectacular aerial displays over the nesting territory. While displaying, individuals often call (produce loud vocalizations) and spread their under tail coverts. The adults can be seen gliding and circling while their fluffy white under tail-coverts is spread out to the sides of the tail’s base. They perform “sky dance,” which involves “high-circling” followed by “slow-flapping” and “undulating flights.” All through the course of the “sky dance,” the birds lose altitude and at the end of the display individuals either “high-circle” or dive into the forest. With the female generally in the lead and the male following closely behind, the pair typically flies with slow, deep wing beats and glides with their wings held in a steep dihedral

### **Preys of Northern goshawk**





or “V.”. Both mates are monogamous with long-term pair-bonds. Prior to the laying, the male regularly feeds the female ([www.bbc.co.uk](http://www.bbc.co.uk) & [www.hawkmountain.org](http://www.hawkmountain.org)).



**Northern goshawk producing loud vocalization**

During courtship, the female goshawk builds a nest or renovates the old one, sometimes with help from the male. Old nests are regularly reused by a succession of different pairs of Goshawk or suitable nests of other Accipiters. The female works for an hour or so in the morning and gathers sticks from the forest floor or breaks them off trees near the nest site, carefully choosing material less than an inch across and carrying the sticks in her beak. After building nest, the birds line the nest bowl with tree bark and greenery and may continue adding fresh green material throughout the nesting period. One study suggests that mating takes place from the start of nest building & through much of the incubation period, often up to 10 times daily ([www.pauldfrost.co.uk](http://www.pauldfrost.co.uk)).

Between April and early May, the female lays a clutch of one to five eggs (bluish in colour which fade to off-white colour) with 1 or 2 days between each in a nest. The female goshawk incubates the eggs and it last for 28 to 38 days. The male hunts and feeds the female and the chicks during this time. The young hatch at around the same time. Once hatched, the male continues to provide food, while the female defends the nest aggressively, even attacking approaching humans. According to scientific research, its extra-ordinary aggressive defense of nest is a kind of adaptation to various tree-climbing species like black bear of Asia and North America ([www.indiamapped.com](http://www.indiamapped.com) & [www.iucnredlist.org](http://www.iucnredlist.org)).

**Northern goshawk nest with eggs and chicks**



## Northern Goshawk breeding chronology

<b>Courting and breeding</b> (late February to April)	Males perform aerial displays to attract females, pairs mate and nests are built.
<b>Incubation</b> (May)	The female incubates the eggs in the nest while the male provides her with food.
<b>Nestling</b> (late May to late June)	The chicks hatch and remain in the nest where they're fed by the adult birds. The male forages far from the nest, while the female remains close by.
<b>Fledgling phase</b> (late June to July)	This is when the chicks learn to fly and hunt, but they stay close to the nest and are still mostly fed by the adults.
<b>Dispersal</b> (August to early September)	By now the fledglings' feathers have hardened and the juvenile and adult birds disperse from the nest area.

Source: [www.pfla.bc.ca](http://www.pfla.bc.ca)

## Nesting Facts

Clutch Size	1–5 eggs
Number of Broods	1 broods
Egg Length	2–2.6 in 5.1–6.5 cm
Egg Width	1.6–1.9 in 4.1–4.9 cm
Incubation Period	28–38 days
Nestling Period	34–35 days
Egg Description	Bluish white, sometimes slightly blotched
Condition at Hatching	Eyes open. Chick covered in short white down, sometimes tinged grey on head and back

Source: [www.allaboutbirds.org](http://www.allaboutbirds.org)

The young develop feathers at around 18 days, and by 28 days they can feed themselves. Fledging occurs between late June to late July i.e. after around 34 to 41 days and they can fly a week later but the young do not become independent until 70 to 90 days old. Till the feeding stage, the male does not often approach the nest, it leaves food a short distance away & then calls the female to collect it. The young males are smaller &



lighter than the females & start flying much earlier. Males develop faster and fledge slightly sooner than females. It takes around 10 weeks from the first flight for the young to become totally independent. The northern goshawk usually reaches sexual maturity at two to three years of age, and has been known to live for up to 19 years ([www.arkive.org](http://www.arkive.org)).

The Northern Goshawk is well known for fiercely defending its nest. Northern Goshawks occasionally attack people and other animals that approach their nests too closely. When agitated or disturbed during nesting season, an adult Northern Goshawk gives alarm call “ke-ke-ke-ke”. They sometimes precede the call with a drawn-out kreey-a. When defending the nest, the female’s call can intensify to a constant scream. Both males and females also use three variations of a wailing kree-ah: members of a pair call to each other when the male enters the territory (often announcing himself with a single-note call), and the female gives a shorter version of the wail when her partner brings food to the nest. Once he delivers the prey, she gives a slower, clipped kree-ah and continues calling until he leaves the area (Rashid, 2016, [www.audubon.org](http://www.audubon.org) & [www.allaboutbirds.org](http://www.allaboutbirds.org)).

The Goshawk is a popular bird in falconry in some areas, being regarded by some as the ultimate hunting bird. In general, they are difficult to train & require daily manning otherwise they lose their training very quickly. Goshawks have nervous temperament & prone to tantrums ([www.pauldfrost.co.uk](http://www.pauldfrost.co.uk))

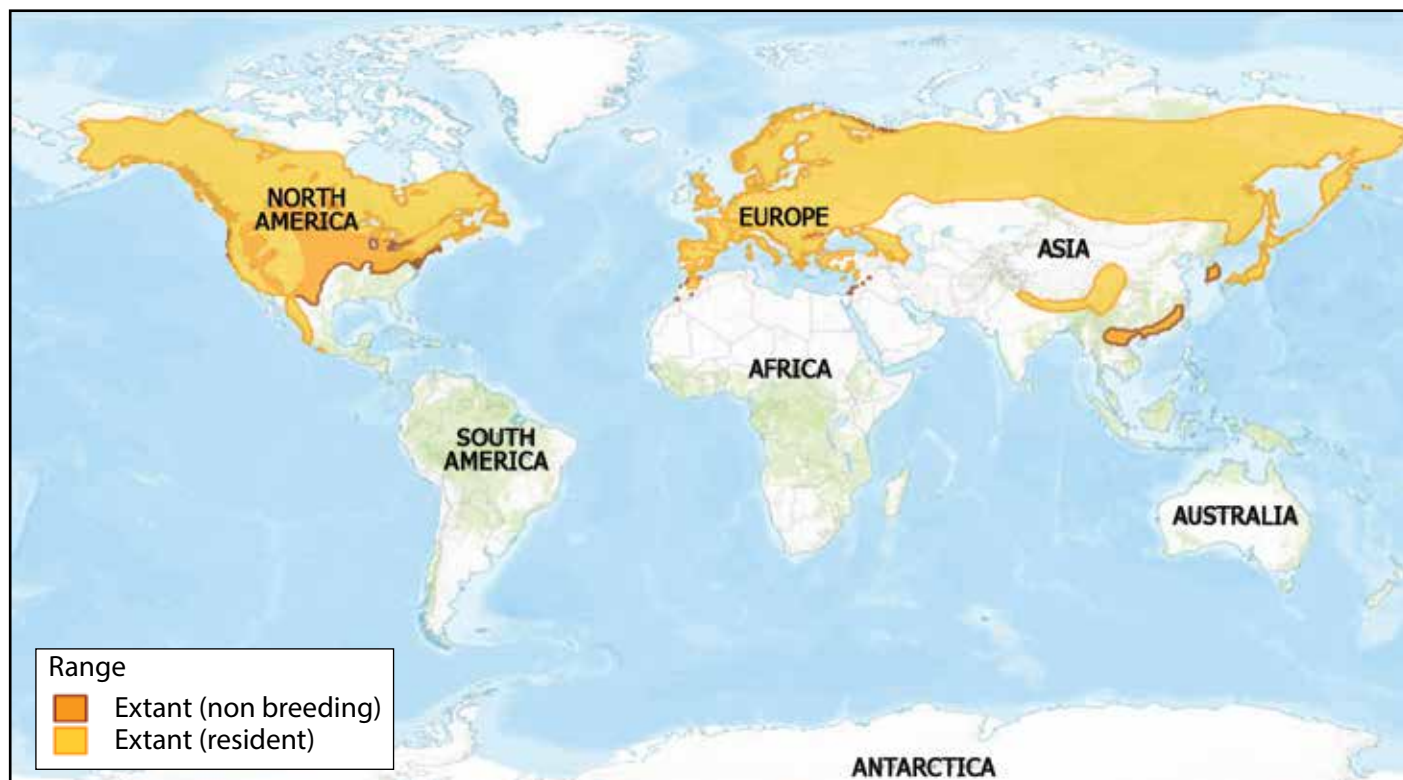
## Global Distribution

The Northern goshawk shows a high degree of geographical variation. Its species inhabit the temperate parts of the Northern Hemisphere and can be found in a number of locations including Asia, China, Europe, Mediterranean, North America, Russia and United Kingdom. It is the only species in the *Accipiter* genus that is found in both Eurasia and North America. Northern goshawk is the only species of “goshawk” in its range (with the exception of Asia) so it is simply referred as “goshawk” in these areas (Rashid, 2016 & [www.arkive.org](http://www.arkive.org)).

It is mainly resident, but birds from colder regions migrate south for the winter. In North America, migratory goshawks are often seen migrating south along mountain ridge tops in September and October ([www.bbc.co.uk](http://www.bbc.co.uk)). The geographic range of the bird is given in **Box 4** and shown in **Map 2**. The 10 recognized sub-species of the bird are given in Table 1.

In the Old World, this species can be found from Britain, east to Japan, with its northern breeding limits reaching as far as northern Sweden and north-east Siberia. Its southern breeding limits extend to central China in the east of its range and extreme north-west Africa in the west, but vagrant individuals may be found in a number of other locations, such as the United Arab Emirates. In the New World, the northern goshawk is found in western Canada, south to Tennessee and southern Arizona in the U.S.A., and Jalisco in western Mexico.

**Map 2 : Distribution of Northern goshawk (*Accipiter gentilis*)**



Source: [www.iucnredlist.org](http://www.iucnredlist.org)

#### Box 4. Geographic Range (Country-wise) of Northern goshawk

##### COUNTRY OCCURRENCE

**Native :** Albania; Andorra; Armenia; Austria; Azerbaijan; Belarus; Belgium; Bhutan; Bosnia and Herzegovina; Bulgaria; Canada; China; Croatia; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Georgia; Germany; Gibraltar; Greece; Hong Kong; Hungary; India; Iran; Iraq; Ireland; Israel; Italy; Japan; Jordan; Kazakhstan; Korea; Kuwait; Kyrgyzstan; Laos; Latvia; Lebanon; Liechtenstein; Lithuania; Luxembourg; Macedonia, Mexico; Moldova; Mongolia; Montenegro; Morocco; Myanmar; Nepal; Netherlands; Norway; Palestine; Poland; Portugal; Romania; Russian Federation; Saint Pierre and Miquelon; Saudi Arabia; Serbia ; Slovakia; Slovenia; Spain; Sweden; Switzerland; Syrian Arab Republic; Tajikistan; Thailand; Turkey; Turkmenistan; Ukraine; United Kingdom; United States; Uzbekistan; and Vietnam.

**Vagrant :** Afghanistan; Algeria; Bangladesh; Bermuda; Egypt; Libya; Oman; Pakistan; Taiwan, China; Tunisia and United Arab Emirates.

Source: [www.iucnredlist.org](http://www.iucnredlist.org)

#### Status & Threats

The Northern goshawk populations are relatively abundant all over the world, however it is widespread in Nearctic and Holarctic zones. Its global population is estimated to number more than 500,000 individual birds ([www.indianbirds.thedynamicnature.com](http://www.indianbirds.thedynamicnature.com)). As per IUCN Red list, the *Accipiter gentilis* is a widespread resident across most of Europe, which accounts for approximately 26% of its global range. The breeding population in Europe is large i.e. >160,000 pairs. Thus, the IUCN (International Union for Conservation of Nature) has categorized and evaluated these goshawk species and has listed them as of “Least Concern” Box 5. While not endangered, northern goshawks are listed in Appendix II of the CITES agreement, which means that they can be traded between countries under certain circumstances, but would be threatened by uncontrolled trade. Northern goshawks are also protected under the Migratory Bird Treaty Act ([www.animaldiversity.org](http://www.animaldiversity.org)).

The population trends of Northern goshawk are difficult to determine as there is no hard evidence of a significant decline in recent decades, but decline in population has been reported in some areas due to habitat alteration (especially logging) ([www.iucnredlist.org](http://www.iucnredlist.org)).

**Table 1. *Accipiter gentilis* subspecies**

Subspecies	Range
<i>A.g. gentilis</i> (Linnaeus, 1758) or Eurasian Goshawk	Europe (except NE and SE) and N Morocco
<i>A.g. buteoides</i> (Menzbier, 1882)	Extreme N Eurasia from N Sweden E to Lena River in Siberia. It winters S to C Europe and C Asia
<i>A.g. albidus</i> (Menzbier, 1882)	NE Siberia to Kamchatka
<i>A.g. schvedowi</i> (Menzbier, 1882)	Southern Urals E to NE China and Amurland
<i>A.g. fujiyamae</i> (Swann & E. J. O. Hartert, 1923)	Japan
<i>A.g. arrigonii</i> (Kleinschmidt, 1903)	Corsica and Sardinia
<i>A.g. marginatus</i> (Piller & Mitterpacher, 1783)	Italy and Balkans, E to Caucasus and N Iran
<i>A.g. atricapillus</i> (A. Wilson, 1812) or American Goshawk	N America from Alaska E through C Canada to N Quebec, Labrador and Newfoundland, and S to SW USA and in E USA.
<i>A.g. laingi</i> (Taverner, 1940)	Occurs in Queen Charlotte Islands and Vancouver Island in W Canada.
<i>A.g. apache</i> (Van Rossem, 1938)	SW USA (Arizona and SW New Mexico) and W Mexico.

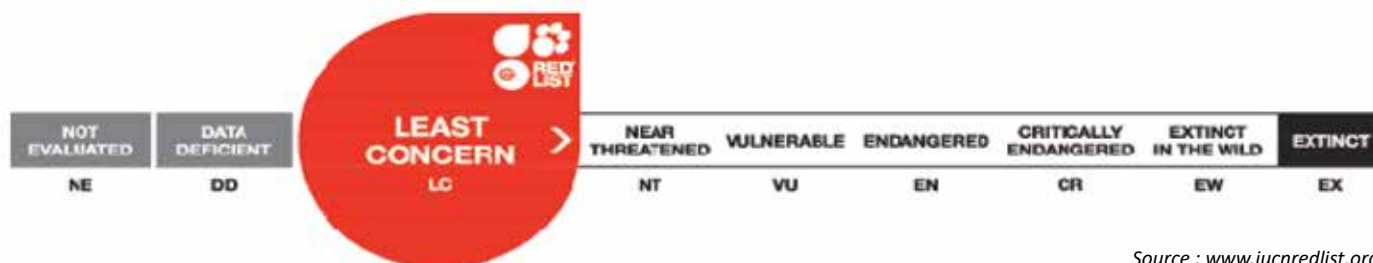
Source: [www.wildearthguardians.org](http://www.wildearthguardians.org) & [www.indianbirds.thedynamicnature.com](http://www.indianbirds.thedynamicnature.com)

#### Box 5. IUCN Status of Northern goshawk

The Northern goshawk is classified in Least Concern category by IUCN (International Union for Conservation of Nature and Natural Resources) in IUCN Red list and listed on Appendix II of CITES. The reasons given by IUCN as justification to keep N. goshawk as Least Concern category are listed below:

- ❖ N. goshawk species has an extremely large range, and hence does not approach the thresholds for Vulnerable under the range size criterion (extent of occurrence <20,000 km<sup>2</sup> combined with a declining or fluctuating range size, habitat extent/quality, or population size and a small number of locations or severe fragmentation).
- ❖ The population trend of N. goshawk appears to be stable, and hence does not approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations).
- ❖ The population size is very large, and hence does not approach the thresholds for Vulnerable under the population size criterion (<10,000 mature individuals with a continuing decline estimated to be >10% in ten years or three generations, or with a specified population structure).

Source: [www.datazone.birdlife.org](http://www.datazone.birdlife.org)



Source : [www.iucnredlist.org](http://www.iucnredlist.org)

The main threats to Goshawks internationally today are the clearing of forest habitat on which both they and their prey depend and poisoning from pesticides. Today, timber harvest is the main threat to breeding goshawks, which depend on mature trees and forests with relatively intact canopies for nesting and foraging. Nesting birds are sensitive to logging activities such as building roads, and loading and skidding felled trees. This species is still threatened by persecution and nest robbing for falconry in some areas of the world. One other important threat for them is wind farms' development.

Evidence from some studies suggests that goshawk populations and reproduction may be declining and some ornithologists observed that current sampling techniques might be insufficient to detect the actual population trends. The

difficulty in accurately measuring goshawk population trends may be due to multiple factors such as:

- ❖ Difficulty in Surveying due to secretive nature of Goshawks
- ❖ Very few studies undertaken in local context
- ❖ Small sample size in studies therefore limited in scope.
- ❖ Research methods, data analyses, and interpretation are not consistent among studies making comparisons across studies difficult.

The concerted efforts and initiatives needs to be taken up by all the concerned departments/organizations to further strengthen the conservation of the natural habitats and breeding zones of the species to facilitate maintenance of viable population in the region.

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Wild Earth Guardians : A Force for Nature

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### Mapping movements of alien bird species

The global map of alien bird species has been produced for the first time by a UCL-led team of researchers. It shows that human activities are the main determinants of how many alien bird species live in an area but that alien species are most successful in areas already rich with native bird species.

“One of the main ways humans are altering the world is by moving species to new areas where they do not normally occur. Our work shows why humans have been moving these ‘alien’ bird species around for the last 500 years -- primarily through colonialism and the increasingly popular cage bird trade -- and why some areas end up with more species than others,” explained supervising author, Professor Tim Blackburn (UCL Genetics, Evolution & Environment and ZSL).

For the study, published in PLOS Biology, the researchers collected and analysed data on the movement of almost 1,000 alien bird species between 1500 and 2000 AD. This was used to create a new open access database which was then analysed for patterns in the context of historical events and natural environmental variation.

More than half of all known bird introductions were found to occur after 1950, likely driven by the cage bird trade, and the researchers say this trend is expected to continue.

“We’ve been able to map alien species richness for an entire group of organisms for the first time in such detail that we can locate populations and the historical processes that led to their introduction. It has given us valuable insights into the different stages of species invasion -- humans play a key role, but so too

do environmental factors that allow alien bird species to thrive in new locations,” said first author, Dr Ellie Dyer (UCL Genetics, Evolution & Environment and ZSL).

The study found that more bird introductions (935 introductions of 324 species to 235 countries) were made in the 17 years between 1983 -- 2000AD than occurred in the 403 years from 1500 -1903AD.

The rate of introductions increased sharply in the middle of the nineteenth century as Europeans, particularly the British, purposefully exported beneficial birds to new territories. ‘Acclimatisation Societies’ moved birds such as ducks, geese, pheasants, partridge, and pigeons to (and from) colonies during this period.

Another acceleration happened after World War II, and continues to the present day. This is most likely driven by growth in trade: many alien bird species introduced in recent years include popular cage birds such as parrots, finches and starlings. Analysis suggests more alien birds are introduced where people have more disposable income -- in many areas, owning an alien bird is a symbol of status, and sometimes species escape or get released.

These historical factors are the main reason why the global map of alien birds shows most species today are found in the mid-latitudes. This is where former British colonies and countries with high GDP are located. Hotspots include the US, Japan, Taiwan, Hong Kong, New Zealand, Australia, and Persian Gulf states.

However, the researchers also found that areas with more native bird species tended to be home to more alien bird species too.

“The term ‘the rich get richer’ certainly applies here. Areas that are good for native birds are also good for alien birds. This isn’t a new observation, but it’s the first time we’ve been able to show it factoring out the key effects of historical human actions,” explained Professor Blackburn. “However, the global bird trade continues to grow, which means we can certainly expect alien species richness to continue to grow in the foreseeable future. It’s a worry because aliens may threaten the survival of native species.”

*Source: Jan.12, 2017, Science Daily*

### **Climate change driving birds to migrate early, research reveals**

A University of Edinburgh study finds birds are arriving at breeding grounds too soon, causing some to miss out on food. Birds with long migrations are expected to suffer most, as other species reach breeding grounds before them.

Migrating birds are responding to the effects of climate change by arriving at their breeding grounds earlier as global temperatures rise, research has found.

The University of Edinburgh study, which looked at hundreds of species across five continents, found that birds are reaching

their summer breeding grounds on average about one day earlier per degree of increasing global temperature.

The main reason birds take flight is changing seasonal temperatures and food availability. The time they reach their summer breeding grounds is significant, because arriving at the wrong time, even by a few days, may cause them to miss out on vital resources such as food and nesting places. This in turn affects the timing of offspring hatching and their chances of survival.

*Source: Dec.28, 2016, The Guardian*

### **Sardar of hunter birds makes rare Jhalana visit**

The recent sighting of Northern goshawk or *Accipiter gentilis*, a raptor (bird of prey), in Jhalana forest in Jaipur has taken ornithologists by surprise. Said to be an inhabitant of colder climates, the bird has been spotted in Rajasthan only five times in the last 25 years.

“The sighting of the medium-large raptor in Jhalana is a rare incident as the bird is not common in this region. It is generally found in the Himalayas. It’s a raptor that is very popular in falconry in Europe. Last year, only one such sighting was reported from Jhalana forest. Goshawks are birds of habit and the sighting of this migratory bird sequentially in the same forest could very well be setting a trend for repeat visits,” said Nirav Bhatt, an avid ornithologist studying raptors for the last 25 years. Following the incident, Bhatt is planning to come down from Gujarat to study the bird habitat in Jhalana.

Northern goshawk has an extremely vast range and is classified as a least-concern (LC) species by the IUCN or not in the red listed category. They are found in North America, Europe and northern Asia. They are also seen in western Canada, south of Tennessee and southern Arizona in the US, Jalisco in western Mexico, northern Indochina, central Europe, central Asia and Himalayas.

“However, in India it is largely seen in Uttarakhand and Ladakh and rarely comes down this side,” said Shahid Khan, a licensed falconer from Jaipur.

According to ornithologists, the bird has been sighted occasionally at Tal Chapar, Sikar and Jaisalmer in the last 25 years. They can be found at almost any altitude, but are typically found at high elevations and seem to thrive only in areas with mature, old-growth woods and where human activity is relatively low.

In winter months, the northernmost populations move down to warmer forests with lower elevations, avoiding detection except while migrating. A majority of goshawks around the world are sedentary throughout the year. “Northern goshawk is a carnivore and known as a powerful hunter. They feed on various birds, small mammals, invertebrates, and reptiles, often utilizing a combination of speed and obstructing cover to ambush birds and mammals. And among the falconers they are known as ‘Shikari Chidiyaon ka Sardar’,” said Shahid.

*Source: Nov.13, 2016, Times of India*

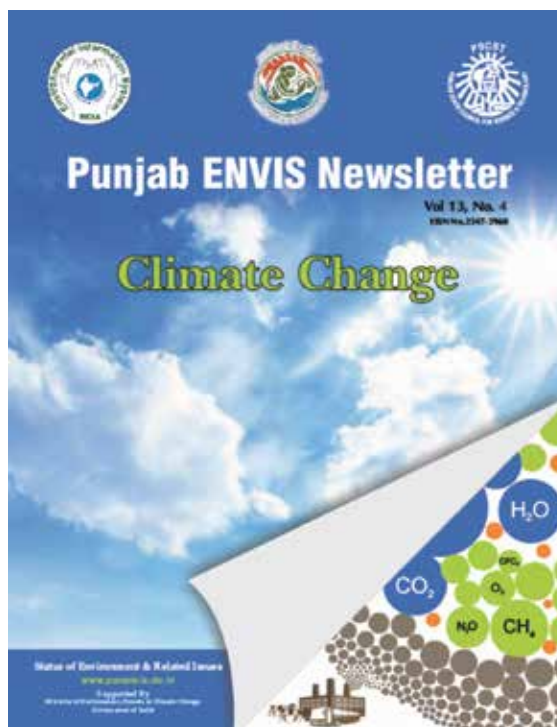
## Achievement of ENVIS Centre

### RCE Recognition Award to ENVIS Publication.

ENVIS Centre, PSCST in collaboration with Regional Centre for Expertise (RCE), Chandigarh has recently published its quarterly newsletter on "Climate Change" (Volume 13, No.4).

The newsletter comprehensively covers major evidences, causes and impacts of climate change along with data/information on future projections and major mitigation & adaptation initiatives being taken at Global, National & State level to combat climate change.

The publication has been recognized and rewarded as "Honourable Mention" by a review committee of UNU-IAS, Japan for its role in addressing the issue of climate change by articulating information and promoting collaborations at the local level.



#### Published by

Punjab ENVIS Centre  
Punjab State Council for  
Science & Technology,  
Chandigarh, INDIA

#### Sponsored by

Ministry of Environment, Forests &  
Climate Change, Government of India

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Acknowledgement : Mr. Gurmeet Singh (President, Nature Conservation Society, SAS Nagar)