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RESEARCH ARTICLE

ESTABLISHED PROTECTED AREAS NETWORK OF WILDLIFE SANCTUARIES, CONSERVATION AND COMMUNITY RESERVES IN PUNJAB (INDIA)

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ABSTRACT

The northwestern state of Punjab (India) encompasses an area of 50,362 sq. kms with 84% of its land under agriculture and only 3.52% under forests. The state harbours three major forest regions namely 1) Shivalik (Ropar, Gurdaspur and Hoshiarpur) 2) Bir (Patiala) 3) Mand (Amritsar and Kapurthala) in six of its districts that support a variety of wild flora and fauna therein. However, the mounting pressures of urbanization and habitat loss are threatening the wildlife in the forested regions of the state. To conserve the remaining natural ecosystems with the idea of protecting and propagating diversity of life, a network of protected areas has been established not only in nine districts of the state under the provisions of Wildlife Protection Act, 1972. This article is focused on the various basic aspects of protected areas established in the state that includes thirteen wildlife sanctuaries, four conservation reserves and two community reserves in the state.

Key words: Protected Area, Wildlife Sanctuary, Conservation Reserve, Community Reserve, National Park.

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INTRODUCTION

A protected area is defined as a geographical area that is protected against exploitation of any of its natural resources. According to IUCN (International Union of Conservation of Nature and Natural Resources), a protected area is a clearly defined geographical space that is recognized, dedicated and managed through legal or other effective means to achieve the long term conservation of nature with associated ecosystem services and cultural values (IUCN, 2008). In other words, these are those clearly demarcated geographical regions where conservation and management are outlined by law. Depending upon the level of protection, any protected area can be classified into six internationally recognized categories Ia. Strict Nature Reserve Ib. Wilderness Area II National Park III Natural Monument or Feature IV Habitat/Species Management Area V Protected Landscape/Seascape VI Protected area with sustainable use of natural resources (Table 1) (Dudley and Stolten, 2008). However, the classification system varies a little from the above mentioned in India. Under Wildlife protection Act (1972), the protected areas can be classified into four major categories i. e. National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves, in India.

Protected Area Categories (India): All the four categories of protected areas in India are strictly aimed to conserve the

ecology and wildlife of the area therein. In national parks, various activities that may harm the wildlife residing in the region are not permitted. It includes forestry, poaching, hunting and grazing of livestock. Even private ownership is not allowed. The constitution of a national park emphasizes mainly on maintaining the ecological significance of the area and strictly reserving it for biodiversity and wildlife. Hence, any national park has its boundaries well defined and no alternation of the boundaries of the national can be made except on a resolution passed by Legislative Assembly of the State Government whereas such an alteration maybe done by the orders of state government in a wildlife sanctuary. A wildlife sanctuary is that protected area that is mainly dedicated to protect the wildlife and conserve the animal species. Restricted human activities are permitted inside the sanctuary but killing, shooting, hunting or capturing wildlife is prohibited except at the direction of higher authorities. Private ownership rights and forestry operations are permissible to an extent that do not affect wildlife adversely in a wildlife sanctuary. To improve the protection in and around existing or proposed national parks and wildlife sanctuaries, two new categories of protected areas, conservation reserves and community reserves, were introduced in the amendment to the Wildlife Protection Act of 1972 in, 2002). These protected areas are actually the migration corridors or connectors between the national parks and sanctuaries. Conservation reserves are uninhabited regions that are completely owned by Government of India but can be used by communities for their subsistence in case a part of the land is privately owned.

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Table 1. IUCN list of classification of Protected Areas and definitions of the six associated management categories of protected areas (Dudley and Stolten, 2008)

Ia Strict Nature Reserve	An area of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring
Ib Wilderness Area	Protected area managed mainly for wilderness protection—large area of unmodified or slightly modified land and/or sea, retaining its natural characteristics and influence, without permanent or significant habitation, which is protected and managed to preserve its natural condition.
II National Park:	Protected area managed mainly for ecosystem protection and recreation – natural area of land and/or sea designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area and(c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally &culturally compatible
III Natural Monument or Feature	Area containing specific natural or natural/cultural feature(s) of outstanding or unique value because of their inherent rarity, representativeness or aesthetic qualities or cultural significance.
IV Habitat/Species Management Area	Area of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats to meet the requirements of specific species.
V Protected Landscape/Seascape	Area of land, with coast or sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity. Safeguarding the integrity of this traditional interaction is vital to the protection, maintenance and evolution of such an area.
VI Protected area with sustainable use of natural resources:	Area containing predominantly unmodified natural systems, managed to ensure long-term protection and maintenance of biological diversity, while also providing a sustainable flow of natural products and services to meet community needs.

Table 2.A list of nineteen protected areas,Wildlife Sanctuaries (A), Conservation Reserves (B) & Community Reserves (C), established inPunjab (India)

WILDLIFE SANCTUARIES				
S.No	Name	Establishment Year	Area (Sq Km.)	District/s
1.	Abohar WLS	1988	186.5	Firozpur
2.	BirAishvan WLS	1952	2.64	Sangrur
3.	BirBhadson WLS	1952	10.23	Patiala
4.	BirBunerheri WLS	1952	6.62	Patiala
5.	BirDosanjh WLS	1952	5.18	Patiala
6.	BirGurdialpura WLS	1977	6.2	Patiala
7.	BirMehaswala WLS	1952	1.23	Patiala
8.	BirMotibagh WLS	1952	6.54	Patiala
9.	Harike Lake WLS	1982	86	Firozpur
10.	JhajjarBacholi WLS	1998	1.16	Ropar
11.	KathlaurKushlian WLS	2007	7.58	Gurdaspur
12.	Takhni-Rehampur WLS	1992	3.82	Hoshiarpur
13.	Nangal WLS	2009	2.9	Rupnagar
CONSERVATION RESERVES				
1.	RakhSaraiAmanat Khan		4.95	TaranTaran
2.	Ropar Wetland		2.11	Ropar
3.	RanjitSagar		18.65	Gurdaspur
4.	Beas River		0	Hoshiarpur, Gurdaspur, Kapurthala, Ferozpur
COMMUNITY RESERVES				
1.	KeshopurChhamb Com R	2007	3.4	Gurdaspur
2.	Lalwan Com R	2007	12.67	Hoshiarpur

However, a community reserve is that geographical region whose conservation of habitat and wildlife is voluntarily taken up by any community or individual. Community reserves do not lie within any national park, sanctuary or conservation reserve and these areas protect the flora and fauna while not affecting the rights of people living inside (Kothari *et al.*, 1989). Currently, India has 103 national parks, 544 wildlife sanctuaries, 76 conservation reserves and 46 community reserves. All these four categories of protected areas cover about 4.93% of the country's geographical area (National Wildlife Database, 2017). This review article focuses on the protected areas that have been established in the state of Punjab (India) and provides a preliminary overview of these.

Protected Area network of Punjab (India)

Punjab, a north western state of India that lies between latitudes 29°33' and 32°32' N and longitude 73°53' and 76°56' E, shares its boundaries with Jammu & Kashmir in the north, Himachal Pradesh in the north-east and Haryana and Rajasthan to the South.

With a typical sub-tropical climate of hot summers and cold winters, the state has three physiographic regions namely, Mountainous Himalayas, Sub-Mountainous Himalayas and eastern and western Alluvial Plains. Punjab is known for a rich biological diversity in terms of its flora and fauna that is under threat due to the loss of habitat owing to urbanization and destructive harvesting of the species. To conserve the natural biodiversity in the state, a network of protected areas has been established for the conservation of its wild flora and fauna in the state. There are a total of 13 wildlife sanctuaries, 4 conservation reserves and 2 community reserves in the state with no national park. Six wildlife sanctuaries have been established in the Bir forest of district Patiala only (Table 2, Fig 1).

A1. Abohar Wildlife Sanctuary

Located at a distance of 15 Km from the city of Abohar in the Fazilka district of Punjab, the sanctuary is a unique open sanctuary spread over 186.5 sqkms of area. Local Bishnoi

community of the region has been making constant efforts in the protection and conservation of the region. The sanctuary is a habitat to several species of plants including kalasiris (*Albizia lebbek*), kikar (*Acacia nilotica*), neem (*Azadirachta indica*), Shisham (*Dalbergia sissoo*), jand (*Prosopis cineraria*) and Drek (*Melia azadirachta*). The sanctuary is known for supporting a large population of black bucks, blue bulls, hare, jackal, mongoose, peafowl and several other species of animals. Recently, a zone in the open wildlife sanctuary has been notified as eco-sensitive zone (ESZ) for having environmental resources of incomparable values (Jerath *et al.*, 2002)

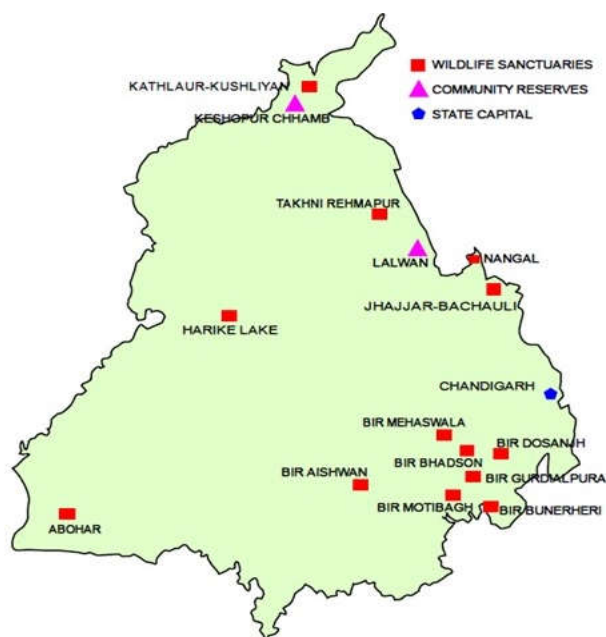


Figure 1. Location of various wildlife sanctuaries and community reserves on the map of Punjab (Punjab State Council for Science and Technology, 2013)

2. Bir Aishwan Wildlife Sanctuary

Situated at 3 Km distance from the district Sangrur, BirAishwan is one of the first sanctuaries established in Punjab. The area was first declared as a protected area in 1952 under the Preservation of Fauna of Patiala Rule, 1896 that was later re-notified as a wildlife sanctuary under the Wildlife Protection Act, 1972. Spread over an area of 2. 64 sq km, the sanctuary provides shelter to a wide range of flora (Shisham, Kahir, Arjun, Jamun, Beri, Kikar, Mesquite, Karonda, Mulberry, Eucalyptus, Neem, Karir, and Simbal) and fauna (Jungle Cat, Hare, Rhesus Monkey, Blue Bull, Jackal, Spotted Owllet, Peafowl, black partridge, grey partridge and rose ringed parakeet). An Environment Chetna Kendra also exists in this Sanctuary area.

3. Bir Bhadson Wildlife Sanctuary

Located in the western Nabha, its one of the biggest wildlife sanctuaries with 10. 23 sqkms of area. The BirBhadson area was declared as wildlife sanctuary under the Preservation of Faunae of Patiala Rules, 1896 vide Patiala and East Punjab State Union Government (PEPSU) notification No. F-150/50 dated 28-2-1952 and the sanctuary is known to harbour a variety of vegetation like Arjun, Beri, Dhak, Drek, Kikar, Mesquite, Neem, Phalahi, Shisham and Sambal with several wildlife species such as Blue Bull, Jungle Cat, Jackal, Rhesus

Monkey, Peafowl, Black and Grey Partridges, Hare, Spotted owl etc. (ENVIS)

4. Bir Bhunerheri Wildlife Sanctuary

Located at a distance of 15 Kms from Patiala, the BirBhunerheri Wildlife sanctuary covers about 6. 62 sqKms of land. Before declared a wildlife sanctuary in 1972, the sanctuary, was once the hunting reserve of the erstwhile rulers of Patiala. In addition to Shisham and Kikar trees in the sanctuary, BirBhunerheri provides a good habitat to wildlife, Hog Deer, Blue Bull, Porcupine, Black Buck, Sambar, Jungle Cat, Jackal, Rhesus Monkey, Peafowl, Black and Grey Partridges, Dove and Spotted owl etc. The bir area was declared as wildlife sanctuary under the Preservation of Faunae of Patiala Rules, 1896 in 1952.

5. Bir Dosanjh Wildlife Sanctuary

The sanctuary covers an area about 5. 18 SqKms on Nabha-Jorepul road in Nabha town of Punjab state. BirDosanjh was declared as wildlife sanctuary under the Preservation of Faunae of Patiala Rules, 1896 in 1952. In addition to different species of plants like Shisham, Phalahai, Kikar, Eucalyptus, Beri, Dhak, Jand, Neem, Sembal, the sanctuary is a home to different wildlife species (Rose Ringed Parakeet, Blue bull, Jungle Cat, Jackal, Rhesus Monkey, Peafowl, Black and Grey Partridges etc.

6. Bir Gurdialpura Wildlife Sanctuary

BirGurdialpura Sanctuary lies at a distance of 45 Kms from Patiala and 15 Kms from Samana in the district Patiala. The sanctuary occupies 6. 62 sqkms of land in the region and was first declared as Wildlife Sanctuary in 1989 and final notification was issued in 2003. BirGurdialpura Wildlife Sanctuary is a home to several species of vegetation including Kikar, Eucalyptus, Neem, Drek, Simbal, Shisham, Beri, Jamun, Arjun and Dhak. Various animal species that reside at BirGurdialpura Wildlife Sanctuary are jungle cat, hare, blue bull, peafowl, jackal, parakeets, black buck, etc. Some of the endangered species found in the sanctuary include otter, pangolin, python and river dolphin. The zoo and a deer park at BirGurdialpura Sanctuary provides shelter to Hog deer, red jungle fowl, spotted owl as well.

7. Bir Mehaswala Wildlife Sanctuary

Having got its name after a village Mehas which is located in the vicinity of the sanctuary, the sanctuary is spread over an area of 1. 23 sqkms closer to townNabha in the district Patiala. The sanctuary was declared a protected area under the Preservation of Fauna of Patiala Act, 1896 in 1952. Though small, the sanctuary supports a diversity of flora (Siris, Eucalyptus, Mesquite, Arjun, Phalahi, Jamun, Shisham, Karri, Khair, Beri, Kikar, Kikar, Simbal, Karonda, Mulberry etc.) and fauna (Jackal, Peafowl, Sambar (deer), Jungle Cat, Blue Bull, Rose Ringed Parakeet, Grey Partridge, Black Partridge, Rhesus Monkey or Rhesus Macaque, Wild Boar, Peafowl, Spotted Owllet etc.).

8. Bir Moti Bagh Wildlife Sanctuary

BirMotiBagh is located in the southern parts of district Patiala (Punjab) that covers an area of approximately 6. 54 SqKms.

The Bir was announced as a protected forest and a wildlife sanctuary in 1952 and the sanctuary is a home to a variety of wildlife including a variety of flora (Toot, Mesquite, Shisam, Kikar, Sirism, Beri, Neem, Mango, Drek, Jamun, Khajoor, Imli, Lasura, Teak, Eucalyptus, Karonda, Bamboo, Kariretc) and fauna (Hog deer, Black buck, Jackal, Chital, Blue bull, Peafowl, Wild boar, Rhesus Monkeys, BrahminyMyna, quails, grey and black Partridges etc.).

9. Harike Lake Wildlife Sanctuary

Harike, also known as Hari-ke-Pattan, is the most important wildlife sanctuaries in Punjab that is located at the meeting point of three districts-Ferozpur, Amritsar and Kapurthala. This man made riverine wetland, a Ramsar site, came into existence in 1952 and covers an area of 86 sq. kms. The site is a home to several species of flora, fauna and thousands of migratory birds from Europe, Siberia during winters. About 55 species of fish and several species of turtles have been recorded at Ramsar site (Moza and Mishra, 2008). According to the reports, there are around 375 species of birds found in the sanctuary, among them 40 species are migrating birds. Some of the regular visitors sighted in the sanctuary include the large cormorant, purple moorhen, bar-headed goose, white-winged tern, tufted duck and the white-eyed pochard. The wetland is a habitat to several endangered and vulnerable species including Great spotted eagle, Eastern Imperial Eagle, Indian Skimmer, Kashmir flycatcher Smooth Indian Otter, and the Testudine Turtle etc. (Birdlife International, 2001). The rare endangered Indus River Dolphin can also be seen here.

10. Jhajjar Bacholi Wildlife Sanctuary

Jhajjar Bacholi Wildlife Sanctuary covers an area of 1. 16 sqkms in the Government forest area of three villages, Jhajjar, Bachauli and Lamlehri, in district Rupnagar. This area was first declared as Wildlife Sanctuary in 1998 and final notification was issued in 2003. A variety of vegetation (Amb, Arjun, Amla, Bamboo, Bohr, Eucalyptus, Dhak, Kikar, Khair, Neem, Mesquite, ChibilPapri, Pipal, Siris, Shisham, Subabul, etc.) and wildlife (Barking Deer, Hare, Blue Bull, Jackal, Leopard, Mongoose, Jungle cat, Porcupine, Pangolin, Sambar, Wild Boar, Python, Cobra, Rat Snake, Monitor Lizard, Garden Lizard, Red Jungle Fowl etc.) make this a sanctuary an attractive destination to visitors.

11. Kathlaur Kushlian Wildlife Sanctuary

Located in the district Gurdaspur district of Punjab, Kathlaur Kushlian Wildlife Sanctuary is spread over a total area of 7. 58 sqkms in two villages namely Kushlian and Kathlour. Punjab government declared this area as wildlife sanctuary in 2007 and the sanctuary has a dense canopy of several species of trees interspersed with open grasslands of Saccharum that is a habitat to several species of deer like the chital, sambar, hog deer and the barking deer.

12. Nangal Wildlife Sanctuary

Nangal wildlife sanctuary is spread over 2. 9 sqkms in six villages (Debeta, Hambewal, Talwara, Bhabahor Sahib, KheraBagh and Sahmipur) in the foothills of Shivalik ranges in Ropar district of Punjab. The wetland is fed by Sutlej river system that attracts over 2, 500-50, 000 migratory birds of 40

different species during winters. The rich biological diversity of the wetland wildlife sanctuary in terms of its vegetation (Aak, Amaltas, Amb, Amla, Arjun, Ashwaganda, Bel, Bahera, Bamboo Bains, Bhung, Bohr, Brahmi, Drek, Harer, Imli, Kahi, Kamal, Khair, Khajur, Kikar), wildlife (Hog deer, Indian Pangolin, Python, Sambar, Smooth Indian otter) and avian fauna (Sarus Crane, Bank myna, Black headed bunting, Blue winged teal, Brown fronted woodpecker, Common Poachard, Common sandpiper, Common teal, Coot, European kestrel, Green parakeet, House sparrow) makes it a unique.

13. Takhni-Rehampur Wildlife Sanctuary

Situated at a distance of 15 Kms from Hoshiarpur on Hoshiarpur-Mehengrowal road, the sanctuary was first declared as a wildlife sanctuary in 1993 and the final notification was issued in 1999. The sanctuary covers an area of 3. 82 SqKms in two villages, village Takhni and village Rehmapur in district Hoshiarpur. Various species observed in the wildlife sanctuary include Barking Deer, Pangolin, Python, Hog Deer, Jungle Cat, Jackal, Mongoose, Wild Boar, Rat Snake and pangolins etc.

B1. Rakh Sarai Amanat Khan Conservation Reserve

Rakh Sarai Amanat Khan conservation reserve is located in Tarn-Taran district of Punjab that covers a total geographical area of almost 5 sqkms. Rakh Sarai Amanat Khan has been declared as Wild Life Conservation Reserve in 2010 for which a separate management plan is being prepared.

2. Ropar Conservation Reserve

Ropar wetland conservation reserve covers an area of 2. 11 sqkms in the district Ropar of Punjab. The reserve was formed in 1952, and later declared as a Ramsar site in 2002. Located at the Shivalik foothills, the conservation reserve lies in the Hoshiarpur-Chandigarh sub-montane plain region and the reserve serves as an important wintering ground for a thousand of migratory birds. The wetland reserve is a habitat to several migratory birds such as Rudy Shelduck, Northern Pintail, Common Teal, Mallard, Gadwall, Eurasian Wigeon, Northern Shoveler, Pochards (Red Crested, Common and Tufted) during winters. Large mammals are mostly absent except for Wild Boar *Sus scrofa* and Bluebull or Nilgai, *Boselaphus tragocamelus*. Sambar, Hog Deer and Smooth Indian Otter have been reported to be present along with thirty-five species of fish in the reserve. Various trees found in the region include Acacia, Dalbergia, Delonix, Salix, Syzygium, Zizyphus, Ipomoea, Cyprus, etc. . Several medicinal plants like *Withania somnifera*, *Adhatodavesica*, *Boerhaviadiffusa*, etc. commonly occur in this area (Tiwana *et al.*, 2008, WWF factsheet).

3. Ranjit Sagar Conservation Reserve

The area was declared as conservation reserve by Punjab Government in 2017. Ranjit Sagar Conservation Reserve is spread over a huge area of about 18. 65 sqkms across three states, Punjab, Haryana and Himachal Pradesh where a variety of wildlife (Leopard, Hog deer, Sambar, Barking deer, Jackal, Mongoose, jungle cat, wild boar, civet cat etc.) found shelter.

4. Beas Conservation Reserve

To conserve the biological diversity, Punjab wildlife department declared 185 Km long stretch along Beas river

(Amritsar) as conservation reserve in 2017, that is considered first of its kind in the country. This restricts fishing, and hunting in the river Beas and the river water is expected to be used for breeding various species of fish including dolphins and other organisms like Gharials and Otters etc.

C1. KeshopurChhamb Community Reserve

Keshopur-Chhamb Community Reserve is first ever notified community reserve of India under the Wildlife Protection Act, 1972 (amended 2002). Situated at an altitude of 245-250 m in Gurdaspur district of Punjab, the region was declared as a community reserve following a Punjab Government Notification in 2007. The Community Reserve with an area 3.4 SqKms is a dynamic freshwater ecosystem that comprises freshwater marshes (natural wetlands over 340ha) that is an important waterfowl habitat and migratory bird corridor during the winter season. The important migratory birds wintering include Gadwall, Pintail, Common teal, Wigeon, Mallard, Shoveler, Black headed gull, Brown headed gull, Booted Eagle, Marsh Harrier, Grey lag Goose, Ruff and Reeve, Garganey teal, Ruddy Shelduck, Spotted sandpiper, Green sandpiper, Spotted Red shank, Common Red shank, Little stint, Little ringed plover, Himalayan Pied Kingfisher, European lapwing, Red Rumped swallow, Bar Headed Geese, White Eyed Buzzard, Black winged kite, Common crane, Imperial eagle, Booted eagle, Hen Harrier, Starling, Yellow headed gray wagtail, White wagtail, White necked stork, Marsh Harrier, Black Stork, Steppe eagle and Greater spotted eagle etc. (Mehta, 2014).

C2. Lalwan Community Reserve

This Community Reserve is situated in Tehsil Garshakar in Hoshiarpur District and is spread over 12.67 sqkms. Lalwan Panchayat area closed under Section 4 & 5 of Punjab Land Preservation Act 1900. This area was declared as Community Reserve in 2007.

Conclusion

In the state of Punjab where most of the landscape has already been transformed by agriculture and urbanization, a conscious effort is under way to preserve not only the wild life but also the ecosystems in Punjab through the establishment of various protected areas.

Apparently, these thirteen wildlife sanctuaries, four conservation reserves and two community reserves in the state are the only remaining natural ecosystems in the state. Since most of the land in state has been converted to farm or urban land, there is much more that needs to be done in the state to maintain a balance in nature. Mere declaration and designation of protected areas do not ensure ecological conservation and wildlife propagation in the region.

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