

Report on Wildlife Week Celebration-2019

Theme: "Life Below Water: For People & Planet"



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Introduction

The animals and plants that live in the wild have an intrinsic value and contributes to the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic aspects of human well-being and sustainable development. Wildlife Week is celebrated all over the country in the month of October from 2nd to 7th October every year with the view to protect the fauna and make common people aware of its importance. Wildlife Week was conceptualized in 1952 with the vision of saving animals by taking some critical steps. In addition, the Indian Government established an Indian Board of Wildlife which works to improve awareness towards the protection of wildlife and it involves the planning to save extinction of animals in India. The theme for World Wildlife Day 2019 is 'Life below water: for people and planet', which aligns with the Goal 14 - Life below water - of the Sustainable Development Goals. Unlike previous years, where wildlife weeks were primarily celebrated on themes pertaining to terrestrial ecosystems and its biodiversity elements, the theme attempted to focus on relatively a new domain of aquatic sphere. To celebrate this occasion, Centre for Biodiversity Conservation & Management, GBPNIHESD decided to organize a transect walk (*Padyatra*) of nearly 5 Km along the river Kosi (Distt. Almora). The walking stretch along the river was deliberately selected to encompass a range of microhabitats along the riverine ecosystem and its biodiversity elements. Over 30 participants (including CBCM scientists/researchers/subject experts) took part in this *Padyatra* on 3 October 2019. The event was started with a brief about the World Wildlife Week objectives and significance of its Theme for 2019 by the Head, CBCM.

General Description of the Kosi River

The Kosi originates from the reserve forest Dharpanidhar Hill which lies in the North West of the Kausani town. It is a non-glacial perennial river and fed by nearly 11 tributaries along its course. According to Hindu scriptures it is also known as Kauski and Kosila. It is the lifeline of the heavily populated Almora town and for thousands of people living along its bank. Besides being critical for the survival, the river embodies significant agriculture, religious, cultural, mythological and historical importance. The river not only benefits people but also supports unique biodiversity elements in its riverine ecosystem. Amid the changing scenario of increasing demand, land use intensification, climate, effluents and others, the river is under tremendous pressure and it is compared now often with connotations like, Blind or Dying river. The perennial stream is gradually transforming into seasonal stream with reduced summer flow and dumping of waste in the river by the locals and tourist.

We selected following three characteristically different sites for detailed study on fauna and flora present along the 5 km stretch of Kosi River.

Characteristics of micro-sites selected along Kosi River

Site-1 (Barrage site)	Site-2 (Near RTC)	Site-3 (Near Devashthal Temple)
Stagnant water in the Kosi dam. River edge (Marshy ecotone area along the river) was studied. Its less bouldary habitat, one side of river dominated by <i>Pinus roxburghii</i> forest, <i>Polygonum</i> sp. dominant in area at marshy land, Sunny/ exposed habitat	Mixing of two water channels Kosi river and Khankal gadhera (that drains a watershed dominated by agriculture) makes river confluence turbid. Shady moist and unexposed conditions. Less bouldary and sandy habitat. Shady areas were dominated by Ferns, grasses and Bryophytes.	River edge (Marshy ecotone area along the river at one side). Rocky at another side of river. Sunny and exposed habitat, marshy area dominated by <i>Polygonum</i> sp. and grasses. Water flow was not so turbulent due to flat terrain.

Site 1- Barrage site

Considering the impact of embankment on river ecology and flow, the site was selected to provide characteristic details of *lentic* ecosystem, where water is relatively calm, deep, and the bottom surface is not exposed to light. The deliberations on lentic water system included, different light zones (photic and aphotic), thermal stratification across different depth zone (epilimnion, thermocline and hypolimnion) and impact of a biotic factors like turbidity, dissolved oxygen on productivity of a lentic ecosystem. Furthering the deliberations, the expert told about some basic a biotic factors such as, pH, DO (dissolved oxygen), turbidity, hardness, alkalinity, and temperature of water which determine the quality of water, which in turn, influence the productivity of system. Explaining about the prime food stuffs of the fishes, it was explained that zooplankton and phytoplankton constitute the staple food of the fishes. While phytoplankton are the main producers and usually occupies the water surface where there is sufficient light, zooplanktons are small aquatic animals and consumers, prefers darker places that feed on other plankton.



Fig. 1. Barrage site deliberations about the riverine ecosystem

Site 2- Near Rural Technology Centre (Kosi Town)

The participants observed that contrary to the lentic conditions at barrage site, the conditions are entirely different as the river flows naturally but not calm, the depth is shallow and river bottom is prominently visible. Secondly, the site is confluence area, where a small stream merges with river Kosi and drains an intensively cultivated and densely populated watershed. Comparing the conditions with the barrage site, the expert explained about lotic ecosystems and attempted to delineate a clear distinction between lentic vs. lotic ecosystems. It was



Fig. 2. Deliberations near RTC at the confluence of a rivulet with Kosi river

noted by the participants that the change in conditions within visibly alike ecosystems attributed to different biodiversity assemblages, therefore required keen and careful observations. Participants were also explained that because of the fast flow of Kosi river, fish usually spawns in adjoining streams with relatively low flow and conducive abiotic conditions by adhering their eggs on small pebbles and gravel. The potamodromous migration thus, ensure high survival rates of eggs, fries and fingerlings of fish, which usually are incapable to withstand the fast current of the main river. The interactions between abiotic (light) and biotic components are

crucial to lotic systems, because it provides the energy necessary to drive primary production via photosynthesis. Generally lotic systems are shallow, therefore can easily be heated or cooled through radiation at the surface. Such shallow streams are typically well mixed (aerated) and maintain a relatively uniform temperature within the river.

Site 3- Devsthal: This site was characterized by relatively slow flow of river Kosi and was moreover similar to the lotic water system, but had boulders and reed along its bank. Emphasizing the importance of this zone i.e. the riparian zone, the expert deliberated on its critical role in river ecology. Such sites, being an interface between terrestrial biome and river system represent a zone crucial for maintaining a healthy river system by facilitating energy flow as well as checking the flow of sedimentation, contaminants and waste, thus acting as natural biofilters. Such zones also supports different reed and emergent plants, thus creating a niche for egg laying insects (Odonates- Dragonflies, Damselflies; Lepidoptera- Butterflies), crabs, fish, amphibian, reptiles and birds. Elaborating further, the experts told that the functions of riparian zone in terms providing a shield to terrestrial perturbations by creating a buffer and creating a interesting place of aquatic and terrestrial life forms makes it a curious area of scientific investigation. During the above deliberations and site visits the flora and fauna encountered by the participants was listed out and identified with the help of resource persons.



Fig. 3. Identification of flora and fauna of river ecosystem

Outcomes of the Padyatra:

During this day-long event a total of 71 species of fauna were recorded from the targeted sites along the Kosi river. As per the experts, along the river Kosi one can find 22 species of Fish, followed by Birds (18 species), Butterfly (17 species), Insect and moth (8 species) and Dragonflies (6 species). The floral diversity along these three studied sites of Kosi river consisted of 17 herbs and 7 grass species at Site-1, 17 herbs, 6 grasses, 3 ferns, 1 species of Equisetum, 2 liverworts and 5 species of mosses at Site-2, and 15 herbs and 7 grasses at Site-3. Detail description of habitat condition of each site. On the bases of recorded floral diversity Site-2 represented the maximum richness of life forms and plant groups as compared to the other two Sites.

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