PRESS RELEASE

Collateral damage: Western Ghats freshwater species in peril

Gland, Switzerland, September 22, 2011 (IUCN)

Freshwater species in the Western Ghats, India, are being sacrificed as collateral damage in the race for rapid economic development. For the first time, comprehensive data are available on the conservation status and distribution of all freshwater fishes, molluscs, dragonflies, damselflies and aquatic plants across peninsular India. Water pollution from agricultural and urban sources, overharvesting and invasive species are the major threats that have led to 16% of freshwater species in the region for which we have sufficient data being classified as threatened with extinction on The IUCN Red List of Threatened Species™.

Alarmingly, the centre of threat is within the Western Ghats Biodiversity Hotspot, one of the Earth's most biodiverse areas, running along western peninsular India. "This unique and up-to-date information will provide invaluable guidance to policy makers, developers and conservation practitioners alike," says Sanjay Molur, Executive Director, Zoo Outreach Organization (ZOO). "It will allow for informed decisions to be made to ensure the survival of our precious freshwater species."

The results of this latest report show that freshwater fish are the most threatened group in peninsular India, with more than a third (37%) at risk of global extinction. For example, the Endangered Deccan Mahseer (*Tor khudree*), is one of the most sought-after food fish in peninsular India. Sadly, due to overharvesting, invasive species and pollution it has declined massively in the past decade leaving some fisheries facing collapse. Another iconic species of fish, Miss Kerala (*Puntius denisonii*) is also classified as Endangered, as it is targeted and collected indiscriminately for the ornamental fish trade and its habitat is being impacted by water pollution from plantations and urban areas.

"If we continue to degrade our freshwater systems and overharvest our resources, we will not only lose biodiversity but also the many valuable services that nature provides us for free," says Rajeev Raghavan, Conservation Research Group (CRG) at St. Albert's College, Kochi.

High altitude pool in Nadugani. © Keystone Foundation

***Labeo boggut.* © Neelesh Dahanukar**

***Botia striata.* © Neelesh Dahanukar**

***Disparoneura apicalis* (male). © Francy Kakkassery**

Hibernating *Cremnochonchus syhadrensis*.
© N.A. Aravind

***Semecarpus kathalekanensis*, a tree endemic to Myristica swamp. © Shrikanth Gunaga**

"Safeguarding these essential natural resources is important, and will become even more so given increasing population growth. If we act now based on the information available, we can make a huge difference to the future of biodiversity and the people that depend upon it."
Many communities across India, particularly those living in the poorest areas, are heavily reliant upon these freshwater species for their livelihoods. This report shows that more than half (56%) of all fish and 18% of all mollusc species in the region are being used for food, and that aquatic plants have a diverse range of uses, with 28% of species providing valuable medicinal resources.

For example, an Endangered freshwater periwinkle, *Cremnochonchus syhadrensis*, is only known from the northern Western Ghats in Maharashtra State, where it is impacted by pollution and water abstraction. It is highly habitat-specific, found only in the spray zones of waterfalls, and hibernates in rock crevices during the summer.

THE IUCN RED LIST OF THREATENED SPECIES™

SSC Species Survival Commission ZOO OUTREACH ORGANISATION CRITICAL ECOSYSTEM PARTNERSHIP FUND

Unfortunately, recent survey work has failed to find the species in one of its few remaining locations. Aquatic plants, such as the Endangered *Aponogeton satarensis*, are also affected. This species of pond weed is found only in a few temporary pools in the Western Ghats hill plateaus in Maharashtra where it is being impacted by development of windmills and increasing levels of tourism.

"The results of this work show the importance of the Western Ghats Hotspot for freshwater species - not only does it harbour a high level of species richness, it also contains many species found nowhere else in the world," says Kevin Smith, Programme Officer, IUCN's Global Species Programme's Freshwater Biodiversity Unit. "Unfortunately, we have also found that this particular hotspot contains the greatest number of threatened species in peninsular India – this all points to an urgent need for environmental sustainability to be given higher priority in economic development."

Notes to editors
Copies of the report The Status and Distribution of Freshwater Biodiversity in the Western Ghats, India is available for download here: **http://tinyurl.com/5tzh36d**

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The Western Ghats assessments
The aim of this project was to provide resources that are essential for guiding decisions on the conservation and sustainable management of freshwater biodiversity in the Western Ghats region of the Western Ghats and Sri Lanka Biodiversity Hotspot. This has been achieved by (i) training specialists (principally from the Western Ghats region) in internationally recognized techniques for assessing the conservation status of species; (ii) collecting data on the distribution, abundance, ecology, and utilization by humans for several groups of species that are reliable indicators of the biological structure and function of freshwater ecosystems in the Western Ghats region; (iii) evaluating the risk of extinction for the species according to the IUCN Red List Criteria; (iv) analysing the results for geographic patterns of species richness, endemism, and existing or impending threats to the species; and (v) making the collected data and the results of the analyses widely and freely available to conservation practitioners and developers alike via print publications, data DVDs, and the internet. The importance and urgency of this work is underscored by the concentration of species found in the freshwaters of the Western Ghats region, the ecosystem services that are supplied to humanity by these freshwaters and their biodiversity, and the increasing threats to the ecosystems.

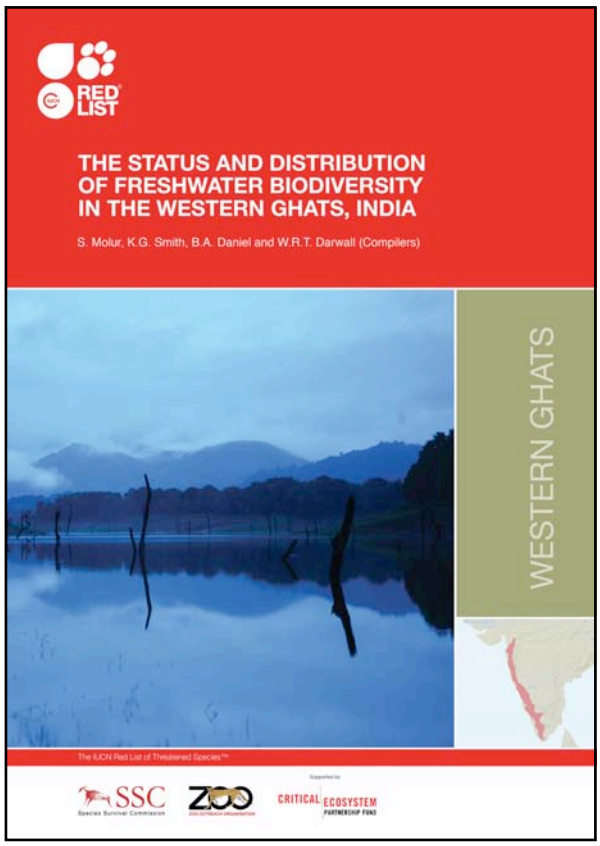
This project has been funded by the Critical Ecosystem Partnership Fund (CEPF).

Executive Summary

The Western Ghats is one of the world's most heavily populated Biodiversity Hotspots providing for and supporting 400 million people through water for drinking, transport, irrigation, and hydroelectric power, together with food and resources to sustain livelihoods. However, the pace of growth of the Indian economy and rates of industrial and urban development are not in tune with the conservation needs of it's diverse freshwater ecosystems and the remarkably high diversity of species they contain. In most instances the development planning process does not consider the requirements of these freshwater ecosystems, mainly due to a lack of adequate information on the distribution and status of freshwater species and the threats they face. There is also little appreciation for the value of freshwater ecosystems to the livelihoods of many highly dependent people, often the poorest in society. In response to this need for information and for raised awareness, the IUCN Global Species Programme's Freshwater Biodiversity Unit, in collaboration with the Zoo Outreach Organisation (ZOO), conducted the *Western Ghats Freshwater Biodiversity Assessment* to review the global conservation status and distributions of 1,146 freshwater species belonging to four taxonomic groups: fishes (290 taxa), molluscs (77 taxa), odonates (171 taxa) and aquatic plants (608 taxa).

The methodology for this assessment is based on the collation and analysis of existing information, requiring experts to be trained in biodiversity assessment methods including application of the IUCN Red List Categories and Criteria, and species mapping using GIS software. Distribution ranges have been mapped to river sub-basin (the logical unit for management) for the majority of species. This provides an important tool for input to the conservation and development planning processes. The full dataset, including all species distribution files (GIS shapefiles), is freely available on the DVD accompanying this report and through the IUCN Red List of Threatened Species™ (www.iucnredlist.org). Additional freshwater groups that have, through other projects, also been comprehensively assessed in the region are amphibians, birds, mammals and crabs and results from these assessments are also available through the IUCN Red List.

Conservation measures are proposed to reduce the risk of future declines in species diversity and the associated ecosystem services that contribute to the livelihoods of millions of people across the Western Ghats region. The geographic scope of this assessment is determined by the extended hydrological boundaries of the Western Ghats region and includes all major river catchments with their origins within the Western Ghats Biodiversity Hotspot. The major river systems of the Tapi, Krishna, Cauvery and Godavari are included within this assessment. Freshwater species native to the Western Ghats states of Gujarat, Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu are assessed, and the states of Andhra Pradesh and western and southern portions of Madhya Pradesh, Odisha and Chattisgarh are included as the drainages of the rivers originating in the Western Ghats flow through these states. Species introduced to the region prior to 1500 AD are assessed, whilst species introduced after that date are considered non-native to the region and are not assessed. IUCN Red List Criteria (IUCN 2001), the world's most widely accepted system for measuring relative extinction risk, were employed to assess the status of all species. Information on



each species was compiled by a core team of experts, in collaboration with Specialist Groups of the IUCN Species Survival Commission and other relevant experts, who then conducted the assessment and its review. More than 40 experts from the Western Ghats region and beyond were involved in the process, either through direct participation in the two review workshops or through correspondence.

Key Outcomes

- The Western Ghats hotspot, originally designated for its high diversity and endemicity of plant species, is confirmed as a globally significant centre of diversity and endemism for freshwater species.
- The southern Western Ghats region with catchments including the Pamba, Meenachil, Muvattupuzha, Periyar, Karuvannur, Bharatapuzha, Chaliyar, Kuttyadi, and Valappattanam (Kerala), Netravati, upper Kabini and Cauvery (Karnataka), upper Vaipar, Amaravati, Bhavani and Moyar (Tamil Nadu) has the highest richness (260–312 species) and endemism (103–129 species) of freshwater species.
- Although many protected areas are located within or near areas of the richest freshwater diversity, the southern Western Ghats region also experiences the highest level of threat to freshwater species.
- The highest numbers of threatened species (40 and 48 species within each sub-catchment) occur within the southern Western Ghats Hotspot in Kerala, Tamil Nadu and southern Karnataka.
- Overall species richness and numbers of threatened species decrease along a northerly gradient through the Western Ghats Hotspot and eastwards towards Andhra Pradesh.
- Close to 16% of the 1,146 freshwater taxa assessed are threatened with extinction, with a further 1.9% assessed as Near Threatened. No taxa were assessed as Extinct or Extinct in the Wild. Approximately one-tenth of

species were assessed as Data Deficient (10.5%), with the two invertebrate groups contributing more to data deficiency (25.8% on average).

- The main threats impacting freshwater biodiversity in the Western Ghats include: a) **pollution**, with approximately 50% of fish, 20% of molluscs, and 21% of odonates threatened, and with urban and domestic pollution ranking as the worst threats followed by agricultural and industrial sources of pollution; b) **biological resource use** with 38% of fishes, 17% of molluscs, and 7% of odonates threatened by commercial fisheries and the aquarium trade; c) **residential and commercial development** with 14% of fishes, 11% odonates and aquatic plants, and 8% of molluscs threatened; d) **dams and other natural system modifications**, with 13% of fishes, 8% of molluscs, 4% of odonates and 3% of plants impacted; e) **alien invasive species** which, as understood currently, impact 22% of fishes; f) **agriculture and aquaculture** which impact 7% of odonates and 4% of plants; and g) **energy production and mining** which impact 6% of fishes, 5% of molluscs and 4% of plants overall.
- The northern Western Ghats region within Maharashtra has a lower documented freshwater diversity than the southern region. Although this trend supports the expected relationship between species richness and rainfall, the lower diversity is probably due to inadequate surveys in the freshwater ecosystems of the west flowing rivers of the northern Western Ghats.
- Catchments that qualify as potential **Key Biodiversity Areas** (KBAs) lie primarily in the southern Western Ghats. KBAs triggered by the highest numbers of fish, odonate and mollusc species include the Pamba, Manimala, Periyar, Bharatapuzha and Chaliyar rivers in the southern Western Ghats.
- Aquatic plants and fishes are the most heavily utilized freshwater groups in the Western Ghats. Twenty-eight percent of aquatic plants are harvested for medicinal purposes, and 14% and 13%, as food for people and animals, respectively. More than half (56%) of fish species are harvested for human consumption, and a growing percentage (37%) of species are captured for the aquarium trade. Eighteen percent of mollusc species are used as food for humans.

Recommendations / Conclusions

- **Taxonomic studies, survey and monitoring**: Freshwater fauna and flora of the Western Ghats are, in general, poorly studied. Population ecology, life history traits and monitoring of most freshwater species lack proper study and documentation. Of the 1,146 species assessed in this project 120 are Data Deficient. Many of these species are likely to be threatened as they are only known from historical records. A thorough taxonomic review and monitoring of all freshwater groups in the Western Ghats is recommended. Particular attention is needed to improve our knowledge of subterranean species.
- **Habitat restoration**: Many endemic species of odonates, molluscs and fishes are narrowly distributed within the Western Ghats. For these species, destruction or alteration of a small catchment may lead to their extinction. Actions required include: a) protection of key habitats such as fast flowing streams and rivers; b) where possible, prevention of flow modifications; c) conservation of specialized ecosystems such as Myristica swamps, high altitude peat bogs, and lateritic plateaus; d) prevention of pesticide and other agrochemical use in upper catchments, and; e) regulation of tourism in critical habitats.
- **Pollution control**: A combination of strategies to combat pollution must be implemented immediately, including: improved enforcement of pollution laws; best management practices for crop and livestock production; effective effluent treatment for the industries located within river basins; promotion of organic cultivation, and better solid waste disposal protocols.
- **Invasive alien species management**: Research into the spread and impact of invasive fish and plant species in the Western Ghats is a priority. Collaboration with industry is essential for educating buyers, sellers, and the public, certifying stock, and preventing the releases into the wild of aquarium and aquaculture species. There is a need to develop and implement a national policy on the introduction and management of exotic species.
- **Environmental impact assessment of development activities**: Dam and road construction, urban and industrial expansion and other development activities should be independently evaluated for impacts, and in case of adverse impacts, mitigation measures must be implemented.
- **Awareness and education outreach**: Awareness programmes promoting better understanding of the values, sustainable use, and management of wetlands and rivers are crucial to eliminating public perception of wetlands as wastelands. Local communities must participate in the conservation of freshwater species and their habitats. Effective educational programmes, with special focus on children, should be implemented. Given the rapid rate of development across the region, politicians, legislators and other relevant stakeholders must be given access to key biodiversity information for freshwater ecosystems and this should be integrated within decision-making and planning processes.
- **Legislation and enforcement**: Legislation to protect species and habitats exists across the region, but implementation and enforcement need to be more effective. Strict laws must be developed and implemented to curb tree felling and deforestation, supported by social forestry and afforestation programmes. Construction of large dams should be avoided where unacceptable impacts to freshwater species and the services provided are predicted. Mining and quarrying should be regulated with strict laws. Threatened and endemic species of freshwater fish of biological and socio-economic importance should be included within the Indian Wildlife (Protection) Act. Policies should also be developed for conservation of lesser-known invertebrate groups such as molluscs, dragonflies, damselflies and crustaceans.
- **Key Biodiversity Areas:** Workshops involving local and regional stakeholders should be carried out to identify and prioritise a set of Freshwater Key Biodiversity Areas based on the potential KBAs identified in the current study. Management plans for these areas can then be implemented to benefit both the many dependant people and the rich biodiversity that these areas support.