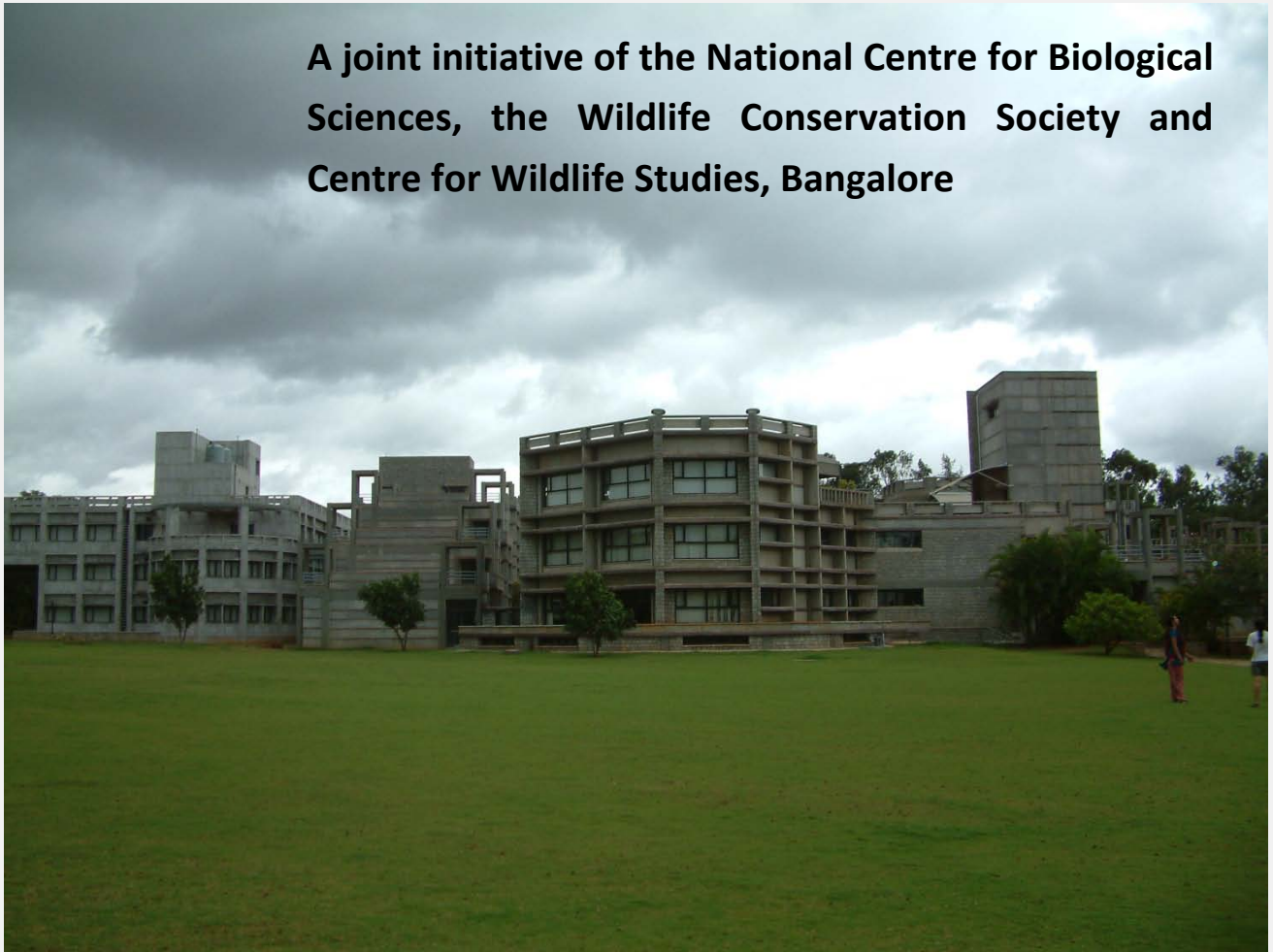


Masters Program in Wildlife Biology and Conservation

A joint initiative of the National Centre for Biological Sciences, the Wildlife Conservation Society and Centre for Wildlife Studies, Bangalore



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Background and Mission

Our imagination of India includes vibrant and varied human cultures as well as tropical rainforests, deserts, snow-capped mountains and incredible wildlife. It appears as if these visions of people, wild lands and wildlife are discordant, yet they must co-exist. With increasing appreciation of the services that wildlife and wild lands provide to the human society, the need to scientifically manage them is urgent and obvious. Despite substantial resource commitments by the government, NGOs and international agencies, the conservation of India's wildlife and ecosystems has been severely handicapped by the lack of well-trained wildlife scientists. This is primarily because the science of wildlife conservation is not being addressed adequately by conventional post-graduate programs at any Indian university. In contrast, the development of this discipline in North America and Europe has been carefully nurtured by universities at the Masters and Ph.D. levels. Countries in these regions have made rapid progress in understanding and addressing major threats to wildlife and disrupted ecosystem functions and services.

Recognizing this, three major institutions, the National Centre for Biological Sciences (NCBS), a premier research institution of the Tata Institute of Fundamental Research; the Centre for Wildlife Studies (CWS), well known for research and conservation of large carnivores and the Wildlife Conservation Society, New York (WCS), partnered to start a Masters Degree Program in Wildlife Biology and Conservation. Several eminent academicians and conservationists in India committed their time to engage with the program through teaching and student mentoring.

The mission of the Program is to:

- Address the severe dearth of wildlife science and scientists in India by training highly motivated and talented students in the field of wildlife biology and conservation through a Masters Degree Program.
- Fill critical information and data gaps in the biology and ecology of India's wildlife and threatened ecosystems through short-term field projects that are conducted by the student for their Masters dissertations.
- Ensure sustained impact of the Program by facilitating continued participation of *alumni* in conservation of wildlife and wild lands in India.

Program structure

The Masters course is a two year program, with the degree awarded from the prestigious Tata Institute of Fundamental Research (TIFR). The course is offered every alternate year to 15 students. Candidates are shortlisted through a highly competitive process comprising a written entrance exam in 30 cities across India and personal interviews. Indian graduates in any field are eligible to apply, reflecting the multidisciplinary nature of wildlife conservation. Students selected into the program

are fully funded through fellowships, so that talented and motivated students are not constrained by financial considerations.

The first three semesters of the course give students theoretical knowledge and practical skills in the ecological, social and quantitative sciences. They are also given an introduction to national legislation and policies and international laws that influence conservation. Another important part of the program is practical training in communicating science and conservation to different sectors of the public through presentations, scientific publications and other print and visual media. Throughout the program, the emphasis is on learning through practical applications, with the students spending about half of their time in wilderness areas in different parts of India such as Andaman Islands, Western Ghats, Himalayas and semi-arid Central India. Similarly, during course work and field visits the students gain both theoretical knowledge that underlies the science of conservation, and firsthand experience of how the conservation of wildlife and natural ecosystems is intricately linked to the livelihood of millions of people and ecological security of the country.



Cohort of 2010-2012 on their first field trip to the Periyar Tiger Reserve, Southern Western Ghats, Kerala



Cohort of 2012-2014 at the CWS field station adjacent to the Bhadra Tiger Reserve with George Schaller

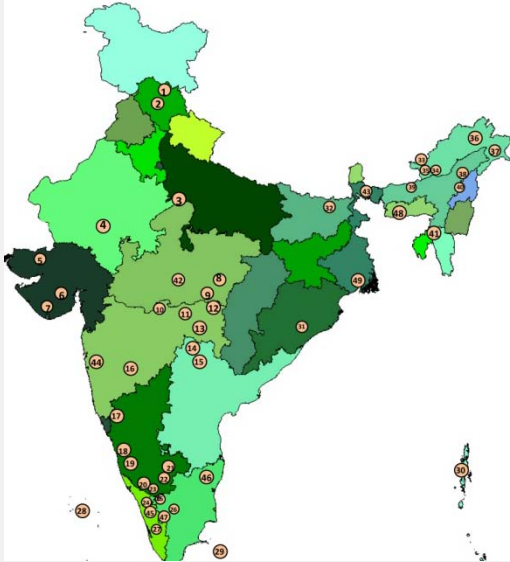


Cohort of 2006-2008 with Ullas Karanth after a lesson in camera trapping



A meeting of the *alumni* in 2012

During the last semester the students carry out field-based research projects as part of their dissertations, which they aim to publish in peer reviewed journals.



Dissertation project sites and some studyspecies and sites

Curriculum and Timelines

Semester 1	Semester 3
<p>Basic Mathematics Introduction to R Basic Ecology Fundamentals of Evolution Philosophy of Science Basic Statistics Vertebrate Ecology Invertebrate Ecology GIS and Remote Sensing</p> <p>Field Trips Periyar Tiger Reserve Bhadra Tiger Reserve Kadumane Estate Mixed-Use Landscape</p>	<p>Ecological History Conservation Law and Practice Landscape Ecology[#] Community and Ecosystems Ecology[#] Social Science Methods for Conservation[#] Conservation Genetics[#]</p> <p>Field Trips Banni/ Velavadar Reserves</p>
Semester 2	Semester 4
<p>Conservation Ecology and Practice Population Ecology Population Estimations Plant-Animal Interactions Behavioral Ecology Advanced Statistics Marine Ecology</p> <p>Field Trips Andaman Islands Nagarhole Tiger Reserve Bhadra Tiger Reserve</p>	<p>Field work for dissertation Write up and submission of dissertation</p>
[#] Electives	

The Faculty

The Program meets its teaching requirements with a combination of core faculty from NCBS and CWS, and guest faculty from within and outside India. Guest faculty are a crucial part of the Program, and handle approximately half the courses. This arrangement gives the Program the flexibility to update curricula and faculty to address emerging conservation issues. In addition, several academicians, forest managers, conservation practitioners, policy makers, politicians and members of the judiciary also give guest talks to the students throughout the year. The students are thus able to interact with a variety of academicians and conservation practitioners and are exposed to the wide range of issues that affect the practice of this discipline.

Program Outcomes

The Program started in 2004 and presently has 74 alumni from five cohorts. Their dissertation projects, spread across most states in India, have covered diverse taxa, from elephants and tigers to birds, turtles, butterflies and coral reef fishes. These projects have so far lead to 50 papers in journals such as *Conservation Biology*, *Biological Conservation*, *Ecological Applications*, *Journal of Applied Ecology*, *Animal Conservation* and *PLoSOne*. Students have also communicated their research findings and policy positions to the wider public through more than 100 popular articles and opinion pieces in magazines and newspapers.

It is a matter of great pride that 70 out of 74 alumni continue to be committed to wildlife research and conservation. Their career trajectories include doctoral and post-doctoral research in top universities across the world, working with NGOs and the government or with independent grants raised by them. The alumni have published more than 80 scientific papers, and have won several awards for their contribution to conservation.

The first PhD Graduates from the alumni



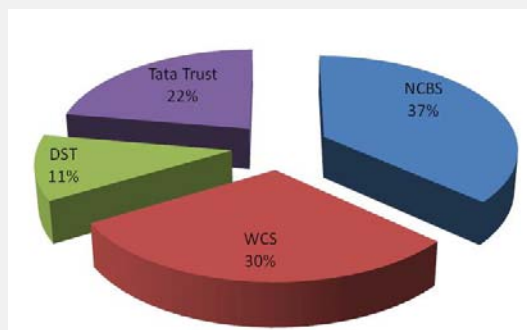
In mid-2013, when Kulbhushan Singh Suryawanshi (Class of 2008) became the first alumnus to get his doctoral degree from the University of Edinburgh, UK and Manipal University, India, it was a proud moment for the program. He was followed by Varun Goswami, Divya Vasudev (Class of 2006) who graduated from the University of Florida, USA, in early 2014, Nibedita Mukherjee (Class of 2006) from Vrije Universiteit Brussel, Belgium, in 2014 and Umesh Srinivasan (Class of 2008) from the National Centre for Biological Sciences. Over the next few years, we expect to see several more of our students become doctoral degree holders and experienced practitioners in positions of high responsibility. We anticipate that the next decade will be definitive in shaping the contribution of this Program to the conservation landscape of India.

Program funding

The Program was initiated in 2004 with a grant commitment of \$500,000 from the Wildlife Conservation Society to the Centre for Wildlife Studies for a period of six years (2004-2010) to cover the operational costs of running the Program. The program was housed at NCBS, which provided all the infrastructural facilities and logistical support. In 2008, the Masters course was formally integrated with the academic program of NCBS, with the degree being awarded by the Tata Institute of Fundamental Research. Since then, some of the major costs of the Program, such as student fellowships, faculty honoraria and travel have been absorbed by NCBS. WCS continues to support major implementation costs of the Program such as the

Director and Program office. In 2009, based primarily on the strong research record of the program, the Department of Science and Technology, Government of India, awarded two grants totaling US\$130,000 to support dissertation projects. In 2014, we secured a five-year grant of US\$260,000 from the Sir Dorabji Tata Trust as the first step towards long term financial sustainability of some critical parts of the course. The operating costs of the Program is about US\$200,000 per year, drawn from multiple funding sources.

Financial support to the Program



Program Governance

The governance of the Masters Program rests with a Steering Committee, an Academic Committee and a Global Advisory Board.

A **Steering Committee**, consisting of *ex officio* members from NCBS, CWS and WCS and invited members from sister institutions, takes all major policy decisions and provides immediate supervision of the Program. This Committee approves annual work plan and budget, and meets at least twice in a year.

An **Academic Committee**, consisting of eminent academicians, advises the Steering Committee on all academic matters such as the syllabus, faculty and course schedule. The Academic Council of the Tata Institute for Fundamental Research is the final decision making body on all academic matters. The Academic Committee meets once a year.

A **Global Advisory Board**, an international panel of renowned academicians, conservationists and fund raisers, advises the Steering Committee on major policy issues and fund raising. The Chairperson of the Steering Committee can approach the Advisory Board, either collectively or as individuals, for advice on specific issues concerning the Program. Although no mandatory meetings of the Board are planned, the public defence of the thesis, scheduled in September of every even year, may be an ideal occasion to have an informal meeting of the Advisory Board.

Steering Committee	Global Advisory Board
<p>Dr K. Ullas Karanth (Chairman), Director, WCS – India: Director, Centre for Wildlife Studies, Bangalore</p> <p>Dr Mukund Thattai (Dean, Academics), NCBS</p> <p>Dr Upinder Singh Bhalla (Dean, Admin), NCBS</p> <p>Mr Pradip Pyne, Head (Admin & Finance), NCBS</p> <p>Dr Uma Ramakrishnan, NCBS</p> <p>Dr Mahesh Sankaran, NCBS</p> <p>Dr Krithi K. Karanth, WCS-New York</p> <p>Dr Anindya Sinha, National Institute for Advanced Studies, Bangalore</p> <p>Dr Jagdish Krishnaswamy, Ashoka Trust for Ecology and Environment, Bangalore</p> <p>Dr Ajith Kumar (Member Secretary), Wildlife Conservation Society</p>	<p>Dr John G. Robinson, Executive Vice President, Conservation & Science, Wildlife Conservation Society, New York, USA (Committee Chair)</p> <p>Dr George Schaller, Vice President, Panthera Foundation, New York, USA</p> <p>Dr James D. Nichols, USGS Patuxent Wildlife Research Center, Maryland, USA</p> <p>Dr Peter H. Raven, President Emeritus, Missouri Botanical Garden, St. Louis, USA</p> <p>Dr Stuart L. Pimm, Professor of Conservation Ecology, Nicholas School of Environment, Duke University, USA</p> <p>Dr Madan K. Oli, Department of Wildlife Ecology, University of Florida, Gainesville, USA</p> <p>Dr K. VijayRaghavan, Secretary, Department of Biotechnology, New Delhi</p> <p>Dr Satyajit Mayor, Professor and Director, National Centre for Biological Sciences, Bangalore</p> <p>Dr. Deepak Pental, Department of Genetics, University of Delhi, New Delhi</p> <p>Dr Vinod B. Mathur, Director, Wildlife Institute of India, Dehra Dun</p> <p>Dr Mahesh Rangarajan, Director, Nehru Museum of Natural History, New Delhi</p> <p>Mr Raj K. Nooyi, CEO, Amsoft103, Deer Lane, Greenwich, Connecticut , USA</p> <p>Dr K. Ullas Karanth, Senior Conservation Scientist -Wildlife Conservation Society, and Director- Centre for Wildlife Studies, Bangalore (Member Secretary)</p>
Academic Committee	
<p>Dr Abi Tamim Vanak, Ashoka Trust for Ecology and Environment, Bangalore</p> <p>Dr Ghazala Shahabuddin, Dept of Human Ecology, Dr.Ambedkar University, New Delhi</p> <p>Dr Kavita Isvaran, Centre for Ecological Sciences, Indian Institute of Sciences, Bangalore</p> <p>Dr Krushnamegh Kunte, National Centre for Biological Sciences, Bangalore</p> <p>Dr Mohan Delampady, Indian Statistical Institute, Bangalore</p> <p>Dr Ravindran, D.S. Indian Forest Service</p> <p>Dr Yashveer Bhatnagar, Nature Conservation Foundation, Mysore</p> <p>Dr. Varun Goswami, Wildlife Conservation Society, Bangalore</p> <p>Dr Ajith Kumar, Wildlife Conservation Society (Convener)</p>	

Program Staff

Until 2014, the Program was co-ordinated and administered by a Director, an Academic Co-ordinator and a staff assistant. With the growth of activities and its alumni over the decade and the proposed expansion of capacity building and outreach activities, an Associate Director joined the Program in early 2014.

For more on the Program, please follow the links below for two video documentaries:

***The New Conservationists* by Mrs Jayashree Rao:**

<https://vimeo.com/86173641>

***The New Hope for Wild India* by Mr Shekar Dattatri:**

http://wcsindia.org/home/?page_id=704

ANNEXURE 1- Scientific Publications from MSc Dissertations

- Andheria, A.P.**, Karanth, K.U., Kumar, N.S., (2007). Diet and prey profiles of three sympatric large carnivores in Bandipur Tiger Reserve in India. *Journal of Zoology*, 273: 169–175.
- Bali, A.**, Kumar, A., Krishnaswamy, J., (2007). The mammalian communities in coffee plantations around a protected area in the Western Ghats, India. *Biological Conservation*, 139: 93-102.
- Goswami, V.R.**, Madhusudan, M.D., Karanth, K.U., (2007) Application of photographic capture–recapture modelling to estimate demographic parameters for male Asian elephants. *Animal Conservation*, 10: 391–399.
- Mukherjee, N.**, Mondol, S., Ramakrishna, U., **Andheria, A.**, (2007). Rapid multiplex PCR based species identification of wild tigers using non-invasive techniques. *Conservation Genetics*, 8: 1465-1470.
- Abraham, D.**, Davis, J., (2008). Revised trunk wash collection procedure for captive elephants in a range country setting. *Gajah*, 28: 53-54.
- Anand, M. O.**, Krishnaswamy, J., Das, A., (2008). Proximity to forests drives bird conservation value of coffee plantations: Implications for certification. *Ecological Applications*, 18: 1754-1763.
- Mondol, S.K., Karanth, K.U., Kumar, N. S., Gopaldaswamy, A.M., **Andheria, A.P.**, Ramakrishnan, R., (2009). Evaluation of non-invasive genetic sampling methods for estimating tiger population size. *Biological Conservation*, 14: 2350–2360.
- Dolia, J.**, Devy, M.S., Aravind, N.A., Kumar, A., et al. (2008). Adult butterfly communities in coffee plantations around a protected area in the Western Ghats, India. *Animal Conservation*, 11: 26-34.
- Krishna, C.Y.**, Krishnaswamy, J., Kumar, N. S., (2008). Habitat factors affecting site occupancy and relative abundance of four horned antelope. *Journal of Zoology*, 276: 63–70.
- Swapna, N.**, Gupta, A., Radhakrishna, S., (2008). Distribution survey of Bengal slow loris *Nycticebus bengalensis* in Tripura, northeastern India. *Asian Primates*, 1: 37-40.
- Teegalapalli, K.**, Hiremath, A., Jathanna, D., (2008). The role of perches in accelerating seed arrival in human-abandoned clearings within Bhadra Tiger Reserve, India. *Journal of Bombay Natural History Society*, 105: 317-322.
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- Karnad, D.**, Isvaran, K., Kar C.S., Shanker. K., (2009). Lighting the way: Towards reducing misorientation of olive ridley hatchlings due to artificial lighting at Rushikulya, India. *Biological Conservation*, 142: 2083-2088.
- Krishna, C.Y.**, Clyne, P. J., Krishnaswamy, J., Kumar, N.S., (2009). Distributional and ecological review of the four horned antelope, *Tetracerus quadricornis*. *Mammalia*, 73: 1-6.
- Mendiratta, U.**, Kumar, A., Mishra, C., Sinha, A., (2009). Winter ecology of the Arunachal macaque *Macaca munzala* in western Arunachal Pradesh, India. *American Journal of Primatology*, 71: 939–947.
- Swapna, N.**, Radhakrishna, S., Gupta, A.K., Kumar, A., (2009). Exudativory in the Bengal slow loris (*Nycticebus bengalensis*) in Trishna Wildlife Sanctuary, Tripura, northeast India. *American Journal of Primatology*, 71:1–9.
- Velho, N.**, Datta, A., Isvaran, K., (2009). Effect of rodents on seed fate of five hornbill-dispersed tree species in a tropical forest in north-east India. *Journal of Tropical Ecology*, 25: 507–514.
- Kelkar, N.**, Krishnaswamy, J., Choudhary, S., Sutaria, D., (2010). Coexistence of fisheries with river dolphin conservation: challenges and opportunities for reconciliation. *Conservation Biology*, 24: 1130-1140.
- Kelkar, N.**, Krishnaswamy, J., (2010) Keeping rivers alive: *Seminar*, 613: 29-33.

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- Srinivasan.U.**, Raza, R.H., Quader, S., (2010). The nuclear question: rethinking species importance in multi-species animal groups. *Journal of Animal Ecology*, 79: 948–54.
- Srinivasan, U.**, Dalvi, S., Naniwadekar, R., **Anand, M.O.**, Datta, A., (2010). The birds of Namdapha National Park and surrounding areas: recent significant records and a checklist of species. *Forktail*, 26: 108–132.
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- Prakash, N.**, Mudappa, D., Raman, T.R.S., Kumar, A., (2012). Conservation of the Asian small-clawed otter (*Aonyx cinereus*) in human-modified landscapes, Western Ghats, India. *Tropical Conservation Science*; 5: 67–78.
- Srinivasan, U.**, Quader, S., (2012). Patterns of species participation across multiple mixed-species flock types in a tropical forest in northeastern India. *Journal of Natural History*, 46: 43–44.
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