

**The White-bellied Heron**  
***Ardea insignis* (Hume, 1878)**

**A Conservation Strategy Workshop,**

**Guwahati, Assam,  
2<sup>nd</sup> - 4<sup>th</sup> December 2014**



© Rebecca Pradhan

**WORKSHOP REPORT**

**March 2015**

## White-bellied Heron (WBH) Conservation Planning Strategy Workshop

### Day 1 (2/12/2014)

#### **Agenda item 1**

##### **Welcome (Plenary)**

Following the Opening Ceremony the previous evening, short addresses of welcome were given by Dr Asad Rahmani (BNHS) and Mr RP Agarwalla, IFS, Principal Chief Conservator of Forests (Wildlife) and Chief Wildlife Warden, Govt. of Assam.

#### **Agenda item 2**

##### **Introductions (Plenary)**

Each participant gave their name, affiliation and interest/experience in WBH, covering hosts, facilitators, sponsors and all participants.

#### **Agenda item 3**

##### **Housekeeping (Plenary)**

This covered the topics: workshop protocols, workshop timeliness, meals and times, reimbursement for expenses, onward travel arrangements, secretariat support to the workshop by ATREE, note-taking for record.

#### **Agenda item 4**

##### **Workshop objectives and products (Plenary)**

Facilitator proposed that we needed to discuss and agree on: specification of the final product; will the proposed Agenda and schedule deliver this? Should there be a workshop report.

Points made in discussion arising, and subsequently grouped:

##### *Biological*

- We must summarise the information we have on the WBH, and identify gaps,
- To fill gaps, we should assign groups to address this and develop information,
- For a summary of WBH biology and ecology, the Status Review should be developed further.

##### *WBH Conservation strategy*

- We must produce a realistic and effective strategy for WBH conservation,
- It should be a high level strategy that comes down to a more specific, range-state level,
- There must be specific recommendations and solutions for particular range states and heron sites.
- It must cover both short term and long term planning
- Short documents have the greatest impact.
- All must be able to review and agree upon it.

##### *Political*

- The conservation strategy must become official policy – we need support from local government. Hence, there can be one overarching strategy plus division by range state with some specific recommendations within,

- There should be an MOU signed, agreement so range states are not working in isolation. This would cover collaborative agreements, formal networking methods and sharing of information,
- Contacts with others must be facilitated: we need to understand how governments can support NGOs, government to government contact and correspondence /agreements.

#### *Resourcing*

- Funding: multiple agencies will be required for funding. Key actions and needs should be mapped. Most important action identified/listed so we can prioritise and coordinate support. Budget estimates very useful.
- We must ensure range states and organisations are not competing for funding, requiring follow-up of the workshop and continuing good relations between parties.

#### *Requirements to ensure impact*

- Impacts for WBH conservation will require access to decision makers, information uploaded and shared with researchers, forest officers and others on the ground,
- A clear way forward must be specified, with allocation of tasks and methods of follow-up,
- Establishment of a project- monitoring committee,
- We must avoid the known risk of site level strategies that are too large, for no-one reads them. We need a nested document, with one main section which is very accessible plus the second level of site-specific detail.

### **Agenda item 5**

#### **Current and Planned Research Activities (Plenary)**

A representative from each group (where applicable) was asked to give a 5 minute presentation outlining what they have done, what we don't know, what we must know, what we must do next.

**NB:** *any new information presented and discussed will be included in the updated Species Review.*

*All presentations will be available to participants on Dropbox.*

#### **Rebecca Pradhan: RSPN, Bhutan (see presentation for more details \*):**

- 8 years of monitoring, from 5am to 6pm; also have community monitors who record and submit sightings, where and how many WBH seen,
- 5 breeding sites known in Bhutan,
- in 2014 10 WBH fledged,
- Have established community feeding sites,
- Pibsoo Wildlife Sanctuary,
- Strategic management plan Dec 2014 includes monitoring, training and captive breeding (CB) plan or head-starting plan.
- So far only one CB effort has been made: incubation within bamboo hut, very simple facilities. San Diego Zoological Society (SDZ) was there to assist. WBH fledge at 71-73 days after hatching. From this CB/headstart effort, one WBH was released at 103 days,

- Genetic work has been ongoing for only six months, but there are six years of data.

**Thet Zaw Naing: WCS Myanmar (see presentation for more details \*)**

- 23 birds total 2011 data (an update on the 18 reported in the Status Review, which will be corrected)
- These birds were seen in the Northern area at Sumprabum, Naungmung, Hukaung Valley Wildlife Sanctuary, and Hponkanrazi Wildlife Sanctuary, but one bird was seen in Shwe Li River in the East Myanmar Ornithological Region,
- Up-to-date repeat survey data are needed,
- Re vegetation use by WBH, it may be in high elevation forest of pine but many Myanmar reports (including of nesting) are in low elevation broadleaf forest.

*Question: could camera trapping help understand more about habitat use?*

**Gopinathan Maheshwaran: Namdapha Tiger Reserve, India (see presentation for more details \*)**

- Possible that the birds seen in Namdapha are also going into Myanmar,
- Estimate just 6-7 individuals,
- 400 m altitude where nest site observed,
- Foraging behaviour being explored:
  - Found: 1-488 mins = range of time taken to attempt to catch a fish
  - Hypothesis: fast flowing rivers and streams used for foraging
  - Want to understand prey species and maximisation of foraging effort
  - So far found: slow forager, lazy. Eye-sight strong. Only 1 of 10 success rate
- Gaps – not currently doing survey outside PAs; want to approach villagers who are fishing outside reserve; hard to do this research, as PA's must get permits from government,
- Nesting trees differ – some are deep in the forest, and may be lower nests, others with open outlook etc.,
- More than 80 species of fish in Namdapha; has applied to get permits for fish samples, and then will carry out research on species; if unsuccessful, will ask local villages outside park,
- Large fish: causes birds to fish for longer for digestion,

*Comment: in Bhutan WBH will eat almost any fish species. In daytime they are less active, and are relatively inactive 9am-1.30/2.30pm; then around 2.30 pm to nightfall they will forage. Behaviour differs during mating/breeding seasons.*

**Niraj Kakati, Atree, India (see presentation for more details \*)**

- Work being carried out in Manas Tiger Reserve: 6 sites surveyed for WBH,
- Green Forest Conservation, New Horizon, Green Earth (grassroots community-based organisations) are all partners who in-turn work with community groups to increase awareness,
- Of 6 sites, 2 are potential no-go zones for people; these have been requested by community peoples following awareness-building by NGOs like Nature's Foster, ATREE and local partners, but these are not official no-go zones;
- Security problems are prevent visitation to all sites,
- Sightings since 2007: Koilamoila, Pagladiya River and Pibsu River. 2013: two birds on Phibsu river from thirty stream-surveys; have also seen three birds on border on the Bhutan side, expect they are the same birds,
- No evidence of breeding in Manas,

- Threats are primarily at local level, e.g. sand-mining, dynamite fishing etc.,
- Seems in winter the WBH comes to lower altitudes,
- There are poachers in Manas, including from across the international border.

**Han Lianxian, Lushui County, Yunnan, China (see presentation for more details \*)**

- East side of Nujiang River (Salween) a WBH was discovered in captivity (sold along roadside around 2,500m a.s.l. though local terrain is predominantly 800-1800m a.s.l.); kept for two days in a home, then reported to authorities and transported to Yunnan Wild Zoo after 3-4 days; suspected cause of death was overfeeding, stress and general weakness. Currently there is a dispute over who gets to keep the specimen, either the zoo or Chinese Academy, which could possibly use it for research. NB - the bird was confirmed, by Rebecca via the image of the bird, to be a young WBH,
- E'zhou Hubei Province, Central China, WBH reported in 2003 but identification not formalized,
- May be some benefit in surveying the following areas: Xiaojiang River in Pianma, Dulongjiang River in Yunnan and Motuo County and Chayu County in Tibet Province,
- *Comment: the habitat shown looks similar to Bhutan; but the area shown is only about 600m a.s.l.*
- In Bhutan, WBH is found between 1,500 m and 600m a.s.l. .

**Thanmi Kashung: Dam Affected Villagers Organisation (no presentation)**

- Dams have downstream impacts,
- 200 megadams are planned for NE India; plus 700 smaller, run-of-river dams planned,
- Manipur – Myanmar will be impacted
- Fish breeding sites are already severely impacted; fish ladders are not working
- Reduction in amplitude of river flow means breeding not triggered in fish; could mean that existing species are replaced by others; we need to understand how specialised each species is to understand if it can survive under alternative conditions,
- Tilapia/other invasives may be introduced potentially.

*Comment: Maurice Kotelat says no successful example of building a fish ladder*

**Jigme Dorji: Community awareness/perception of WBH in Bhutan (see presentation for more details \*)**

- Humans and WBH overlap in their habitat use in Bhutan,
- Local people are aware of their occurrence along Punatsangchhu and Mangdechhu Rivers, mainly in winter (pre-monsoon and post-monsoon), and population decline is seen in the same areas,  
Conclusions: local people are not a threat, they have minimal impacts. One must influence the policy makers; hydro and large scale infrastructure developments are key threats so need to influence national policy and decision makers,
- 50% area of Bhutan may be suitable habitat for WBH,
- Dams will also cause other increased infrastructure (including roads and power lines), and will increase forest exploitation by those no longer able to fish etc.

*Comment – it would be useful to know how much local people fear/understand dam impacts and the level of stakeholder involvement in building/development process (GG discuss with Samir and Peter B, IR)*

*Comments:*

*Different issues are present in India and Myanmar from Bhutan, more likely to view the species as food in the former. However, even in Bhutan outside workers (also hydro related) will still persecute the species, throw stones to kill etc., so dam-building can bring these additional issues despite relatively high profile species and schedule 1 protection in Bhutan.*

*What about the social responsibility of dam builders? Number of Bhutanese people impacted by dams is predicted to be low so social justice argument not likely to work. Problems associated with immigrant labourers with different levels of knowledge, differing attitudes toward wildlife etc., and with high turnover.*

*The impacts of dams in NE India are greater, particularly for livelihoods, i.e. agriculture. When land is a community resource, it means that land- owners are compensated but those who use the land as a common access resource are not compensated. This causes knock-on impacts for forests and wildlife.*

*Broader scale awareness required, and pressure on decision makers.*

**Cathy King: Captive breeding (see presentation for more details \*)<sup>1</sup>**

- Supplementing the wild population - subject to the factors causing decline of the current population are identified and resolved,
- Behaviour-shaping may be possible as management technique before release of captive-bred birds,
- Genetic reservoir: creating a reservoir captive population as a safety measure to ensure genetic diversity is appropriate when genetic diversity is at great risk, because of low numbers of individuals and/or isolation of sub-populations,
- San Diego Zoo used the Great Blue Heron, *Ardea herodias*, as a model; herons are generally fairly easy to breed (e.g. Goliath heron) and to work with in captivity,
- Tracking systems can be tested in zoos.

**Genetics, Udayan Borthakur, Aaranyak and RSPN (see presentation for more details \*)**

- Working with RSPN, Bhutan to analyse genetic data
- From 7 individuals, feathers and egg shells have provided particularly good genetic material,
- Mitochondrial haplotype and nucleotide data mapped for 5 individuals across 3 nesting locations: high haplotype diversity but low nucleotide diversity,
- Result suggests population size in Bhutan may not have changed so much over history, suggesting never a particularly abundant species in Bhutan; appears from data thus far to have been historically a rare species,
- Mitochondrial DNA phylogeny suggests *Ardea insignis* is a sister species to *Ardea purpurea*<sup>2</sup>.
- See Zhou *et al.* (2014): paper on *Ardea* species phylogeny.

---

\* Copies/details of presentations can be requested by contacting the WBH Working Group Coordinator

<sup>1</sup> Post workshop comment: Captive-breeding was not a major topic at the workshop, yet is of interest to Bhutan; it is expected that captive-breeding and possible further aspects of intensive management for WBH will be covered in a Bhutan national strategy for WBH, due by mid-2015. Captive management plans thus far include taking eggs from the wild only.

<sup>2</sup> Post workshop comment: Information is needed on a further plausible sister species, the great-billed heron, *Ardea sumatrana*.

*Comments/thoughts/questions:*

- *Streams/river use: what does WBH do and use? are we losing important microsites, can we compensate for these?*
- *Altitude-are there seasonal differences in altitude use?*
- *Dams and river regimes, turbidity, fish migrations/productivity: many unknowns. How will planned dams impact WBH?*
- *Climate change and impact on WBH unknown – can we map vulnerability/susceptibility?*
- *Surveys needed.*
- *Hunting – need to understand more about intensity of threats*

*Will Duckworth comments*

- *Threats have plausibly changed and developed from historical issues,*
- *Other large herons – very tolerant birds, tame, broad habitat use, can live in chemical pollution, so why are WBH so different?*
- *Never heard it said WBH was common or found in flocks, so maybe it naturally occurs at low density,*
- *Can nest at wide altitudinal range; it breeds in lowland areas viz. 400m in Namdapha, and 600ft a.s.l. in Myanmar so not just at high altitudes,*
- *If birds move around seasonally could be missing lots of information, i.e. during monsoon season etc.; much habitat is inaccessible for much of the year,*
- *Concerning the apparent great retraction in range in Myanmar, we need to be careful that it is not just due to unsurveyed areas; how many areas could hold WBH that we do not know about?*
- *WBH is seen in fast flowing, wide rivers with boulders; however, some historical records show feeding in lakes, in grasslands, i.e. Ada Lake; therefore, how wide/specific are its habitat requirements?*
- *Is WBH shy only because it's persecuted? At Ada Lake it is shown to be in close contact with people; we can observe similar behaviour in grey heron – shyness of the species depends on persecution level; what is the situation at Ada Lake?*
- *Bhutan – the known instances of WBH deaths are relatively high considering low numbers,*
- *Hunting could be a bigger issue than we think – especially by local people; even a limited off-take of a rare species can drive decline; hunting pressure can also lead to behavioural changes: in the early 1990's the grey heron in Laos became nocturnal because of daytime hunting,*
- *Given the size of Bhutan and possible seasonal or post-fledging movements of WBH, it is plausible that threats to Bhutan birds include killing outside of Bhutan,*
- *WBH distribution in Bhutan defies easy explanation: some areas superficially similar in habitat to those that have WBH and lack WBH. One main river appeared to lack large fish-eating species almost entirely. The survey effort seemed good enough that this was not a misleading pattern of chance recording. Understanding what is driving this situation could really help (a) predicting where in unsurveyed or undersurveyed areas are prioritise for survey and (b) what conservation interventions are needed.*
- *How much area remains unsurveyed in each country that is potential WBH range?*
- *Why do other waterbirds seem scarce in Namdapha? Is it due to mere short-term observations?*

**Surveys:**

- Bhutan: eight years of surveying have covered 353 small lakes and streams; it is felt Bhutan has been well covered; suggestion we should not rule out Eastern Bhutan totally as possible habitat,
- India: gaps for surveys in India are huge,
- Myanmar: camera traps placed inside Hukaung Wildlife Sanctuary, for tigers, got an image of the WBH on a small stream, albeit only a few hundred metres from a main river: this perhaps challenges the assumption that they live only on big rivers; on small forest streams, it would be very difficult to find birds by typical survey techniques.

### **Discussion on species biology**

#### *Dispersal:*

- Rebecca – time of year is very important: in February nesting birds are not seen on bigger river as are in/by smaller rivers; no breeding birds will be on the bigger rivers; in September the birds return to the larger rivers. Therefore, season and the time of observations are key. But there are still mysteries such as around river water temperature and flows: looked at in Bhutan in a habitat that seemed to be very suitable, but no WBH; cannot understand why absent from this large catchment area but WBH occurs in other very similar areas.
- Jigme: low water level may be necessary, for as water level increased WBH left; but as water level rises, so does flow rate and turbidity; we need more information on dispersal behaviour.
- Thet – seems that the WBH do not disperse seasonally in Hukaung Valley, Myanmar; they stay on same rivers all year; one of these rivers is over 100m wide.

#### *Human presence:*

- Western Assam: found birds very shy and fled when people present,
- Namdapha: consensus is that the birds flee because they are not used to human presence, not because they are persecuted<sup>3</sup>,

*Comment: could human disturbance be the reason that similar streams/rivers (i.e. seemingly good WBH habitat) are unoccupied? Or is much of this ignorance due to gaps in monitoring, due to access and political turmoil, so we just do not know?*

#### *Feeding/freshwater habitat requirements:*

- Bhutan's headstart programme showed no fish species preference for feeding, only preferences in size,
- Seems WBH have a low level of foraging. It is able to feed in faster flowing water than many birds that feed in standing posture; thus, WBH prey-stock might overlap more with birds that are swimmers (e.g. cormorants and oriental darter) than other river margin stalkers (i.e. other herons, storks etc.),
- Behaviour is different between Bhutan, India and Myanmar even in terms of timing of foraging,
- India- fast flowing rivers are occupied; in Myanmar, both fast and relatively slow-flowing rivers are used,
- Hukaung Valley: huge variation in water flows throughout the year,
- Turbidity: agreement between India and Myanmar participants that there must be clear water for feeding (but not observed in turbid water), but Bhutan has observed feeding in murky water after hydropower development caused churned/cloudy water,

---

<sup>3</sup> Post workshop comment: acknowledging that it is not known if such WBH were resident, nor their ranges and experiences post-fledging.



- Lake Ada, Bhutan: green algae are prolific, with lots of fish due to religious fish releases into the lake, so feeding efficiency may be high; herons would feed here in the shallow area and on streams nearby; also no problem with cattle nearby; WBH was seen flying over one other lake but not known if it stopped there.
- Namdapha: WBH only seen in rivers with broad banks.

*Comment: It is important to remember that the birds may inhabit suboptimal habitats in some or all areas, in cases where little or no optimal habitat is left. Seasonal differences in occupation of habitats – might relate to big and small rivers.*

*Numbers:*

- From 2003-2014 Bhutan monitored 44 nests in total; if you estimate just one chick survives to adulthood per nest, there should be over 50 individuals in Bhutan,
- Numbers this year in Bhutan were 22 individuals,
- The fate of the other birds is not known.

*Comment: seems that there has definitely been a reduction in range and in numbers, but it is unlikely that it has ever been a very common bird.*

#### **Agreement within group about generalised behaviours:**

- WBH historically occurred at fairly low densities,
- WBH range has declined in area,
- Found in solitary or in small groups, not in flocks,
- Proximity to humans does not necessarily mean adverse impacts,
- Food seemingly not in short supply and does not seem fussy in diet.

#### **Differences between range state observations:**

- WBH does not always need fast flowing waters,
- Width of rivers, stream preference seems to vary,
- May nest on narrow streams but not always,
- Altitude of used areas seems to vary with location.

Other bird presence, as possible insight into competition etc.:

Namdapha has egrets, storks, cormorants,

Hukaung – has Grey Heron, egrets, storks, cormorants and Oriental Darter etc.

*Comments:*

- *Could increasing snowmelt have an impact on WBH? Response was this is unlikely as most of these rivers are rain fed/monsoon reliant; however, lakes upstream will be impacted; water levels in glacial lakes are being lowered to reduce flooding. Other CC impacts to consider.*
- *Namdapha (India) and Myanmar have a potentially overlapping population of birds but there is no evidence that the species interacts or that any population is isolated; BUT intervening areas are poorly studied and must be better understood,*
- *India and Bhutan may also have interacting populations,*
- *Is it possible that Bhutan is the source country i.e. birds migrate from Bhutan to other countries; it's possible but unknown.*

#### **Agenda item 7**

#### **Developing a Vision for the WBH (Plenary)**

Facilitators briefed participants on the purpose of creating a Vision and what it should encompass: an ambition for the WBH that is challenging yet realistic, not idealistic but to hold promise, with a stated time period.

Plenary discussion:

There was some discussion about how many individuals or breeding pairs of WBH we should/need to aim for, including:

- Bhutan – first aim would be to have 30 individuals to match population found when surveys started in 2003; it was suggested maybe 40 would be their target but need to know more about requirements and carrying capacity of suitable remaining habitat. If the headstart/captive breeding programme goes ahead, within the first three years they are aiming for two breeding pairs only.
- Others in the group suggested 30 individuals is not a viable population, and effective conservation would require international collaboration.
- Bhutan believes there might not be any room for more birds with dam building. However, they can use mitigation and substitution methods to ensure they maintain what they have. Worry is that they do not understand what the issue is to restrict carrying capacity. In principle there should be more than 50 birds if look at breeding effort and current success in the wild.
- Conclusion – the group agreed that at this stage, it is not possible to identify target numbers.

#### **Vision discussed:**

A suggested Vision was presented to the group. There were lots of comments regarding wording and use of the Vision for marketing, as well as the need to keep it short. The general consensus was that it would be useful to make the WBH a flagship for wetland conservation/to inspire and motivate people to conserve it; to link it to human/local activity but to ensure we do not overstate its role in ecosystem services etc. (as this is unknown and with the WBH at such low densities unlikely to be of great significance); to include scientific research; to have a timeline but not to include exact numbers.

A small working group was selected to bring together the remaining ideas of the group and formulate a final version of the Vision to be presented and agreed upon the next morning.

#### **Day Two (3/12/2014)**

The small working group presented its suggested Vision; following group discussion, this was agreed:

#### **Vision:**

**“By 2020 we will achieve the effective conservation of White-bellied Heron across its range countries as an inspiration and challenge for ensuring healthy riverine eco-systems and their dependent human communities.”**

The very short time frame for the Vision reflected participants’ consensus that conservation action for the WBH is particularly urgent.

#### **Agenda item 8**

#### **Developing Goals (Plenary – Working Groups – Plenary)**

The facilitator presented the purpose of Goals, describing them as the operational version of the Vision, describing what we want to for the WBH, but not how we will do it.

This led to plenary discussion on Objectives:

**Effective conservation for the WBH will include:**

- Research/knowledge base for WBH ecology and behaviour, on which to found science-based action,
- Better understanding of the impacts of dams,
- Better understanding of climate change impacts,
- Fish surveys,
- Genetics of WBH populations understood,
- Habitat protection,
- Captive breeding,
- Supplementation and mitigation methods in face of threats,
- Education and awareness-raising,
- Capacity building,
- Policy development.

*Comment:*

*In addition, the following Actions are needed: knowledge/research, maintenance of current population, reducing threats to the species, habitat, outreach and communication to external stakeholders, coordination and building a bigger group of people working for the heron.*

*Comment:*

*Catchment based approach for riparian and river systems are key. Perhaps more drastic measures are needed: as with the crested ibis (from 17 to 2,000 birds within about 30 years, and now doing some reintroduction into Japan). So, for WBH: focus on a single population, protect nest, and ensure each bird fledges. There are serious gaps in knowledge of the biology.*

**Plenary discussion led to definition of three main themes for Goals:**

**1) Knowledge base/research** (effective conservation)

Increase research data, generate knowledge and share it,  
Use this information, through policies, strategy, influence and awareness.

**2) Healthy heron habitat**

Governance,  
Taking account of all stakeholders and the environment,  
Maintenance of productivity and ecosystem functioning, including unpolluted waters, safeguarded from human activities deleterious to fish stocks,  
Catchment-based approach to ensure we capture all threats,

**3) Dependent human communities**

Preservation of riparian forests to protect against extreme events,  
Water quality – clean drinking water, irrigation, sanitation,  
Protein sources for people,  
Support/encouragement and development of local livelihoods that are sustainable and compatible with WBH conservation,  
Pride and a sense of place/ownership of local natural resources and species.

Participants were then divided into three working groups, with each group containing representatives of each range state (excepting China as there were only two representatives)

Each group was assigned one Goal area, from above, from which to develop a Goal statement

Each working group then presented its draft Goal for discussion and finalization in plenary. The agreed Goals were:

**Theme 1: Research/knowledge:**

**Goal 1:**

**Design and effectively implement immediate interventions to reduce the extinction risk of WBH, informed by a sufficient understanding of the species' distribution, population status, natural history, threats and their social context across its range.**

**Theme 2: Healthy Heron Habitat and Habitat-based Threat reduction:**

**Goal 2:**

**To maintain healthy riverine ecosystems in the White-bellied heron's range with governance frameworks that ensure development and livelihood activities are consistent with the species' conservation, based on best scientific evidence.**

**Theme 3: Human Communities:**

**Goal 3:**

**Empower communities through education and awareness to enhance their sense of responsibility to and ownership of the WBH and its habitat, and to inspire governments, civil society and donors to engage in coordinated and immediate efforts to conserve the species.**

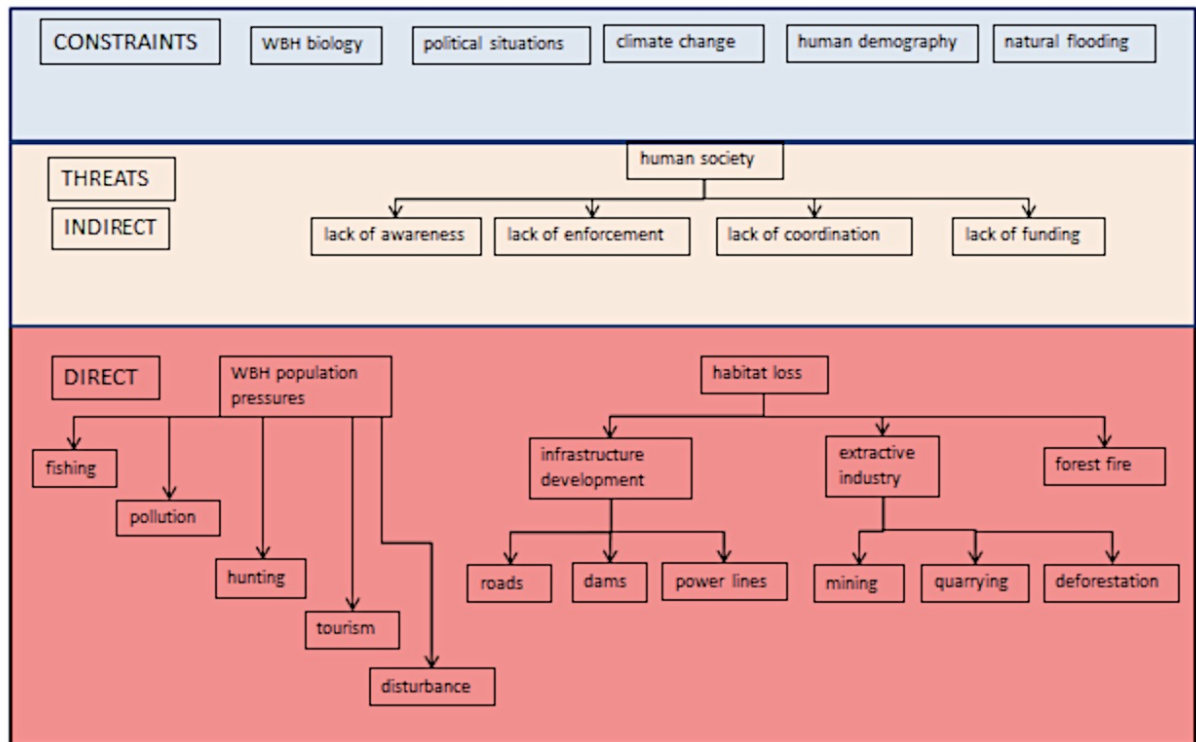
**Agenda item 9**

**Problem analysis**

The facilitator presented the idea of Threats, with illustrations of possible direct and indirect threats to the WBH; further, participants were asked to identify constraints to the effective conservation of the WBH; these are large factors that are beyond the power of conservation to influence or mitigate.

The identified threats to the WBH would be assigned to one of the above Goals, and the subsequent Objectives would have to respond to the Threats, thereby meeting the Objectives and Goals.

Each participant was given three cards on which to write a Direct or Indirect Threat or a Constraint. These were then grouped based on common meaning under a simple heading. The combined set of headings from the raw Constraints and both Direct and Indirect Threats have been converted into a Threat tree in the diagram below:



Constraints, direct and indirect Threats to WBH persistence

These were then grouped to fit under the three goals as identified above so that Objectives could be set using them.

#### **Agenda item 10**

#### **Developing Objectives (Plenary – Working Groups – Plenary)**

The facilitator introduced the purpose of Objectives, which are in summary:

- 1/ To address Threats and Constraints as far as possible,
- 2/ To meet the agreed Goals.
- 3/ Objectives should ideally be precise and quantitative.

#### **Goal 1**

##### **Objectives**

- 1.1 Implement a coordinated research strategy across the species range to understand key aspects of ecology of the species including seasonal and daily movements, post-fledgling dispersal, foraging activity (and success), breeding success and habitat selection.
- 1.2 Identify, prioritise and survey areas where the species is expected to occur (or has occurred historically).
- 1.3 Understand population size, connectivity, trends and spatial heterogeneity/patterns across the range.
- 1.4 Define the known and potential threats and understand the role each may have in the extinction risk of the species across its range.
- 1.5 For each threat study and interpret the human motivation and needs that produce it.

#### **Goal 2**

##### **Objectives**

- 2.1 Appropriate protection and designation afforded to all priority WBH habitats.
- 2.2 No illegal or destructive fishing practices within designated priority WBH habitats
- 2.3 No new dam construction and operation on rivers with key WBH populations without complete, publicly available environmental and social impact assessments, coupled with a full suite of appropriate mitigation measures, with dam developers / operators responsible and accountable for complying with formally-specified measures and conditions,
- 2.4 No sand or gravel extraction, or gold-mining within designated priority WBH habitats
- 2.5 Power lines (high voltage and reticulation) incorporate global best practice engineering design to mitigate collisions/electrocution risk, with modification measures to existing power lines to mitigate risk to flying WBH .
- 2.6 No new road construction along rivers with confirmed breeding populations of WBH without measures to mitigate negative impacts on the species, informed by global best practice.

### **Goal 3**

#### **Objectives**

- 3.1 To ensure the highest level legal protection status of WBH in each range country and encourage the full commitment and strengthening of capacities of the government in effectively enforcing protection and legal actions.
- 3.2 To sensitize, raise awareness and inform all sectors of society for more concerted efforts for WBH conservation by government and other relevant organisations, with support of the general public and donors.
- 3.3 To reduce unsustainable and illegal practices that negatively impact the WBH or its ecological requirements (for foraging, resting, breeding etc.), by providing alternative sustainable opportunities, which do not threaten the heron, with as much local-level oversight and management as possible and appropriate.

### **Day 3 (4/12/2014)**

#### **Agenda item 11**

#### **Developing Actions (Plenary – National Working Groups – Plenary)**

Facilitator presented the idea and requirements of Actions: they are detailed statements of what we are going to do, to counter the Threats and meet the Objectives, They must be based on rigorous analysis of cause and effect, in order to avoid unintended and undesirable consequences,

Each Action must be SMART:

S = Specific

M = Measurable

A = Achievable (in principle the Action can be successful)

R = Realistic (not only Achievable but resources etc. will be adequate)

T = Time-bound

Each Action must:

- Specify the resources needed (money and others such as personnel, skills etc.),
- State who will do what when,
- State who is responsible for the Action and answerable,
- State the indicators of completion,
- Preferably are prioritized.

It was envisaged that while the Goals and Objectives covered WBH conservation range-wide, the Action would be specific to each range state. Accordingly, all participants from each range state formed a single working group to develop Actions specific to their country.

Each range state presented its set of Actions in plenary. These will provide will be further refined by range state facilitators and stakeholders post workshop. Following further discussion, a number of WBH range-wide Actions were proposed in the interests of moving conservation action for the WBH along speedily.

**The country-specific and range-wide Actions are presented at the end of this report, immediately after Annex 1 containing the Threats and Constraints.**

### **Agenda items 12 and 13**

#### **Workshop follow-up and Implementation of the WBH Conservation Strategy (Plenary)**

The following was agreed:

<b>No.</b>	<b>Country</b>	<b>Action</b>	<b>Responsibility</b>	<b>Timing</b>
1.	<b>International</b>	G. Goodman / Synchronicity Earth to be interim International Coordinator  (Including developing social media presence, information portals/products, communication strategy, working group structure etc.)	G. Goodman	Immediate; to last until substantive Coordinator post is funded, process of recruitment agreed and suitable person found
2.		Appointment of International Coordinator: 1. Develop job description 2. Secure funding 3. Recruit and in position	1 & 2. G. Goodman, W. Duckworth, J. Tordoff  3. Recruitment will involve steering committee members of the Working Group	1. 2015, 2. 2015, 3. end 2015/early 2016
3.		Establish WBH Working Group: possibly located within IUCN SSC Heron Specialist Group: approach Chair SSC and Chair Heron SG	G. Goodman, W. Duckworth	February 2015 (completed)
4.		Develop an agreed list of Action points for next 12 months both collectively and for each range state, through refinement of workshop Action list	Technical Team, Interim Coordinator	To be finalised for input to Conservation Strategy, by June 2015; to be reviewed at Nov. 2015 workshop
5.		Preparation of agreed follow up workshop in November 2015, to be hosted by Bhutan	S. Wangchuk and RSPN to work with WG Coordinator	Through 2015

6.		Update survey, range and historical record maps	W. Duckworth M. Crosby BirdLife, RSPB	March 2015
7.		Review, update and add to WBH Status Review	M Stanley Price, G Goodman and Range State Facilitators (with input from wider community)	April 2015
8.		Circulate workshop report	M. Stanley Price, G. Goodman	January 2015 (completed)
9.		Circulate draft range-wide Conservation Strategy for review	M. Stanley Price, G. Goodman	April 2015
10.		Complete range-wide WBH Conservation Strategy with country strategies separated out	M. Stanley Price, G. Goodman	June 2015
11.		Identify potential funding sources and each range state to submit proposed list of priority funding needs	Range state facilitators, J. Tordoff, W. Duckworth, G. Goodman	June 2015
12.		Publish and disseminate information about WBH and its conservation	G. Maheshwaran, R. Pradhan, Thet Zaw Naing, W. Duckworth	Starting first half of 2015
13.	<b>Bhutan</b>	Appointment of National Facilitator	Bhutanese participants	First quarter 2015 (completed)
14.		Completion of Bhutan Action Plan for WBH	Bhutanese participants	Will be available in March 2015 to all
15.		Bhutan National Heron Week: all to be advised of dates	Bhutanese participants	January 2015
16.		Send formal letter to government/ministry for regarding WBH and surrounding actions once purpose and contents agreed	Relevant Bhutanese organisations, Chair SSC, G. Goodman, M. Stanley Price	Before completion of Conservation Strategy, mid-2015
17.	<b>India</b>	National meeting on species recovery to be held	A. Rahmani	When possible in 2015
18.		Selection of National Facilitator for India	A. Rahmani, S. Khaling	First quarter 2015 (complete)
19.		To obtain endorsement of WBH conservation strategy for India from government	A. Rahmani	Following completion of conservation strategy for India,



				mid-2015
20.		Raise awareness of WBH in India through, for example, a postage stamp	A. Rahmani	When appropriate
21.	<b>Myanmar</b>	Selection of National Facilitator for Myanmar	Htay Win, Thet Zaw Naing	First quarter 2015
22.		Send formal letter to government/ministry for regarding WBH and surrounding actions once purpose and contents agreed	Relevant Myanmar organisations, Chair SSC, G. Goodman, M. Stanley Price	Before completion of Conservation Strategy, mid-2015
23.	<b>China</b>	Selection of National Facilitator: Prof. Han selected		Done

#### Off-Agenda item

#### Survey and distribution maps of WBH revisited

The workshop had available the following maps:

1/

- i. maps of estimated WBH 'original' range,
- ii. map of estimated current range,
- iii. map of distribution and known important dam and PA sites.

These were generated through GIS by Aaranyak, BirdLife and RSPB.

**Key:** Purple dots: sightings before 2000 (from BirdLife, 2001)  
Red dots: sightings since 2000

Available upon request.

2/ Maps of surveyed areas superimposed on Google Earth images (courtesy of J. Tordoff and relevant surveyors).

Available upon request.

#### J. Tordoff observations on updated distribution map

- Historical records show an apparent range contraction; part of this might be a result of lack of monitoring in recent years in some areas,
- This suggests a possible inverse correlation between distribution of species and incompatible human activities along rivers; it seems low levels of human presence are important

- For large areas where we do not have any data we should **not** make any conclusions about the absence of the bird,
- Lots of areas are politically sensitive and have not been surveyed recently,
- Need more surveys in Myanmar and in Arunachal, more in the east of India; possibly concentrate on areas of low human activity to start with.

These maps are attached as Annexes 2 and 3.

**Comments on maps (in plenary):**

- *Bhutan has surveyed 355 rivers over 12 years. Though eastern side has had less intense monitoring but still did three years' worth of surveying in all seasons (over 4 years).*
- *Maps show historical range is all in hilly areas i.e. potential suitable habitat.*
- *Question asked if there could be a relationship between presence of forests in lowland/hill foot streams (marginal hill areas) and persistence of heron? And whether the Bhutanese and Indian populations are linked or comprise one population?*
- *Maps – could include to 1,500m contours to add to Bhutan map; although RSPN found this to be upper limit, we should not assume it is applicable to anywhere but Bhutan.*

**Next steps/Actions for map:**

- Consider including contours,
- Consider including pre-2001 records,
- Assess use of variables for mapping presumed historic range,
- Add in total Protected Areas, and areas covered by survey,
- Include locations which were surveyed but no WBH found,
- W Duckworth to contact G Buchanan of RSPB to learn what data and variable were used for GIS maps of supposed historic and current WBH ranges.

**Implementers:** Will Duckworth (ASAP) and Mike Crosby and RSPB. Possibly also Aaranyak to assist.

**Agenda items 14 and 15**

**Thanks and Closing Formalities**

The hosts, BNHS and Atree, thanked all participants for their attendance and enthusiastic participation and contributions. The participants suitably thanked the hosts, facilitators and the magnificent support team from Atree.

The hosts declared the workshop closed.

## **Annex 1: WBH: Threats and constraints**

**These are the combined results of Threats from each Group:**

### **Group 1:**

#### **WBH Biology**

The following were suggested as possibly of importance, but for none is there certainty as to its role or importance:

- Low survival of offspring, natural predator, low population density equal to growth of susceptibility,
- Direct threat: WBH sterility, constraints: use of chemical fertilizer in agriculture production,
- Ignorance of sites used, despite confirmed sightings in Assam at Phibsu, Koilamoila, Chowki (Subankhata); with potential habitats at Phekua, Jamduar, Saralpara (Ultapani), Kuklung, Khalingduar,
- Attack by other predators like the Dhole (Asiatic wild dog) and lesser cats,
- Species' naturally low population density (fact?) along linear features and K-strategy lifestyle (pressure) mean even small death rate (hunters? powerlines?) could put the population into decline.

#### **Political Situations**

- Uneven governance, unrest,
- Setting up military security camps in the habitat area,
- Lack of national legal conservation measure/action,
- Sensitive political as well as law and order situation in entire WBH ranging areas of eastern Himalayas,
- Low-level political awareness of WBH and its conservation situation.

#### **Lack of funding**

- Inadequate conservation resources.

#### **Lack of knowledge/science**

- Targeted conservation efforts are difficult, threats poorly understood, distribution and population not known,
- Lack of research and understanding meaning potential and financial support for targeted actions is near impossible,
- Weakness of CEPA program,
- Lack of knowledge on behaviour and territory,
- Limited knowledge of what threats drive declines in populations,
- Lack of some important information of WBH ecology, mining destroys river ecosystem,
- Knowledge based on key aspects: habitat require feeding ecology, breeding biology, population ecology are lacking, so, no scientific base to build conservation action and strategy,
- Unexplored area where WBH is unknown may already be lost even if WBH existed there: lack of basic exploratory information,
- Lack of knowledge about the WBH distribution,

- Information gap about species biology.

#### **Poor law enforcement**

- Policy, legal status,
- Weakness of law enforcement,
- Lack of legal protection to enact rules.

#### **Lack of Coordination**

- Lack of institutional setup,
- Limited coordination among different stakeholders/lack of resources,
- Lack of institutional setup to enhance participatory approach (to offset opportunity cost vis. payment for environmental services).

#### **Climate change**

- Climate change (receding of glacial lakes would lead to drying up of streams), glacial lake outburst floods and other flooding,
- Siltation of wetlands and due to developmental works, climate change.

#### **Group 2:**

##### **Sand Mining and Quarrying**

- Boulder removal, Quarrying and Sand mining (it pollutes river, disturb birds, destroys habitat),
- Mining,
- Indirect threat: sand and gravel, boulder mining near the habitat,
- Use of river banks and margins for recreational use or down time by workers,
- Sand gravel mining in the habitat area,
- Land use change, cover extraction of sand and stones,
- Sand and stone quarrying by private business companies,
- Sand mining along river beds (reduces habitat for WBH),
- Extraction of boulder, sand, earth from riverbed damage the habitat of WBH,
- Sand/stone quarrying,
- Sand mining in the rivers/mining for valuable minerals: sand mining spreading along rivers as rural areas develops and villagers go to the nearest sand gravel bars where the bird uses as feeding ground, large scale mining destroys the whole mountain a and poison the river in many cases,
- Mining: mining of sand, coal in the river and the forest area have posed severe threats for the WBH,
- Severe human disturbance: stone quarrying, sand mining, destructive overfishing, grazing, and mere presence of people,
- Quarrying for boulders,
- Mining causes pollution and disturbances.

##### **Deforestation**

- Deforestation by illegal felling, conversion to plantation, habitat shrinking,
- Conversion of forest and wetland to plantation, weak environmental safeguards and lack of comprehensive land use policy and planning,

- Cutting of trees by communities illegally, deforestation for construction of dams leads to shrinking of habitat for WBH,
- Deforestation leading to shrinking of habitat for WBH,
- Natural calamities leading to shrinking of habitat for WBH,
- Due to large scale of deforestation near the range of WBH habitat, the survival of WBH is endangered,
- Deforestation.

### **Dams**

- Flows affected impacting aquatic biodiversity, fish availability, foraging, affects ecosystem function,
- Dams are destroying the movement of fishes, which makes their food source scarce,
- Big dams can lead to disturbance of natural flows of river which can result in changes to fish habitats both upstream and downstream,
- Unknown impacts of change in river ecology due to sudden release of large amount of stored water (which may be cold, anoxic and polluted) to produce electricity during peak electricity demand period,
- Mega Projects,
- Tunnelling/Dam construction,
- Habitat loss: infrastructure development,
- Construction of mega dam will disturb the natural flow of the river which will cause detrimental changes to the present habitat of WBH including its prey species,
- Dam destroys feeding sites,
- Direct threats like mega dam are assumed to impact flows, fish population, other aspects – yet no hard and concrete information,
- Changing of river dynamics and flow regime,
- Since Indian government has planned 200 mega dams and 700 small dams, all across the suitable habitats of WBH, it will definitely be going to have a cumulative impact on the species survival and breeding but there is an opinion also that WBH can adapt to certain changes and it is known to breed over a great range of elevation. What threats will it face with sudden fluctuations of the water level?
- Tunnelling river diversion,
- Cumulative impacts of three large dams in Subansiri river in Arunachal Pradesh,
- Absence of proper fish ladder from dam construction obstructing the migratory route of fishes,
- Hydropower (and other ) dams alter hydrology in ways that reduces foraging success and food availability of WBH,
- Change in water flows to structure as a result of agricultural practices, gold mining, dams to irrigation change ecosystem functioning, fish abundance etc. in ways we do not fully comprehend especially in terms of impact on WBH,
- Sale of power/electricity to China,
- Dam building affects natural flows changing aquatic communities and abundance as heron food source associated with catchment system is drastically disturbed/destroyed hill slope forest which could affect routine/ nesting of heron

(water catchment with dam coming in China: China helps building dams in Myanmar so may be big impact).

### **Fishing**

- Overfishing illegally by use of dynamite, electric shocks etc.,
- Intensive fishing in WBH habitat,
- Overfishing,
- Destructive fishing directly decimates fish/ other food sources population and presence of fisherman and noise disturbs birds,
- Fishing,
- Illegal fishing in habitat areas, poaching for food in the area,
- Dynamite fishing,
- Electric fishing methods,
- Use of poison, dynamite etc. for fishing activity in the habitat,
- Human disturbance to the birds feeding water become poor quality, no good quality nesting free,
- Fishing community livelihood,
- Extensive fishing in the river by using small meshed net, explosive, electricity cost reduction for the prey species and WBH disturbs the ecosystem,
- Direct threats (root causes): Overfishing, Indirect threats: low conservation awareness and low grass root support for conservation,
- Decrease of fish population and other feeds due to human interference catching /poison etc.

### **Pollution**

- Industry, tragedy, impact on fish,
- Industrialization: in recent years, industries are coming up near the riverine ecosystem making the habitat of WBH polluted. The industrial effluents discharge into the river increases the turbidity of river thereby reducing the visibility of fish in the water.

### **Forest fire**

- forest fire,
- direct threat: accidental fire (forest), difficult terrain to control fire in short time.

### **Power lines**

- Power lines: incidental,
- Electric shock,
- Power line mortality (collision and electrocution) will have an increasingly important impact on populations as electricity availability increases in WBH range,
- Electric wires obstructing the flyway of WBH,
- Mortality due to nest fall, electrocution, disease (rescue can be an option).

### **Roads**

- For dams, for newly colonized area, for development,
- Construction of farm roads,

- Development of road connectivity along the course of large river in Arunachal Pradesh,
- Developmental activities – road construction on habitat, cumulative impact because of river dam,
- New roads leading to human colonization of pristine river.

#### **Gold mining**

- Direct: gold mining , indirect: weak enforcement
- Direct: human encroachment for gold and amber mines in WBH habitat; Indirect threat: weak environmental safeguards and weak laws (root causes)

#### **Natural Flooding**

- Natural flooding,
- Floods that change course of water flow. This is a natural process which may create prime WBH foraging habitat which persists only until the next floods which again change the river structure. An artificially regulated river regime may not provide such temporary habitat.

#### **Habitat Loss**

- Infrastructure development , degradation, human intervention,
- Direct threat: habitat, fragmentation with developmental activities (obstruction of prey migratory route with setting up of infrastructure in between),
- Loss of prime habitat triggered by infrastructure development and development activities,
- Short supply of food may prevents WBH from breeding each year,
- Habitat lost,
- Paucity of habitat due to human intervention in range areas,
- Degradation of WBH habitats.

#### **Agricultural / Land use practices**

- Land use policy, pesticide, watershed damage, conversion of forests,
- Threat: agriculture: the expansion of agriculture in the wetland areas and also in the hill slope areas the livelihoods of the WBH are already endangered,
- Faulty land use practices,
- Land use policy,
- Constraints: turning the forest areas into agriculture land development activities. Human activities, like the various security forces,
- Land use policy,
- Use of pesticide in agriculture (indirect): these pesticide are drained into the river along with the rain water thereby polluting the river and might be making the food sources unhealthy,
- Conversion of forest into various land uses.

#### **Group 3:**

##### **Hunting**

- Death/hunting for food, impact on behaviour, encroachment,

- Direct persecution or hunting of WBH also impacting flight behaviour, knowledge or research,
- Hunting,
- Threat: Hunting: hunting of wild animals for food due to lack of proper means of livelihood is also become a threat to the survival of WBH,
- Possible hunting: The WBH habitat in Namdapha has Lisu encroachers nearby, who are traditional hunters by birth; also there is threat due to human presence in those areas<sup>4</sup>,
- Hunting of WBH depletes already small population and negatively influences behaviour by making WBH reluctant to use resources they require.

#### **Human encroachment**

- Human encroachment,
- Increased encroachment of people on WBH habitat as a result of infrastructure development, population growth and possibly poor encroachment.

#### **Tourism**

- Development of WBH habitat, anything, disturbance,
- Development of the habitat as tourist site and destination for the picnic groups,
- Uncontrolled gathering of people in the form of picnic, tourism may disturb the WBH,
- Tourism pressure: angling is a tourism activity which is disturbing their habitat.

#### **Lack of awareness**

- Government involvement, decision maker unaware, local people: lack of awareness,
- Lack of governmental/ public awareness: government agencies/ decision maker not aware of the dire state of the species and the urgent need of proactive conservation interventions. General public not aware of the initial status, also lack mass support in general and conservation concept in local scale resulting in hunting of such rare species like any heron,
- Lack of awareness about WBH and its legal status,
- (Outside Bhutan) very low profile of species in decision maker's mind,
- Limited knowledge and awareness on the role of local communities in WBH conservation (to strengthen local initiatives and responsibilities),
- Lack of awareness with respect to WBH,
- Public have low awareness,
- Targeting bird by stone pelting, lack of awareness about its endangered condition in the range area like in China,
- Lack of people's awareness, destruction of habitat, lack of political will,
- Lack of awareness among local residents,
- Lack of awareness (people unaware about significance of WBH).

---

<sup>4</sup> After workshop comment: this statement needs to be reconciled with earlier statements that WBH in Namdapha are relatively secure from human disturbance.



**Human population and growth**

- Increasing human population will drive development of riparian and riverine habitats of WBH, shrinking the range of the birds further,
- Human settlements,
- Excessive resource use,
- Species occurrence on stream (mostly wide and navigable??) brings it into high contact with people who (in most areas) it seems to wish to avoid (or now it widely uses narrow forest interior streams too?),
- Growth of human population leading to unemployment which has led to activities like overfishing and deforestation.